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DEPARTMENT OF TRANSPORTATION
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AUG 23 2019

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IN REPLY REFER TO:
HWY-DD 2.8288

July 17, 2019

TO: THE HONORABLE BRUCE S. ANDERSON, Ph.D.
DIRECTOR OF HEALTH

ATTN: SCOTT GLENN, DIRECTOR
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

FROM: JADE T. BUTAY 
DIRECTOR OF TRANSPORTATION

SUBJECT: FINAL ENVIRONMENTAL ASSESSMENT AND
FINDING OF NO SIGNIFICANT IMPACT FOR
KAMEHAMEHA V HIGHWAY, MAKAKUPAIA STREAM BRIDGE
REPLACEMENT, PROJECT NO. STP-0450(010)
DISTRICT OF MOLOKAI, ISLAND OF MOLOKAI
TAX MAP KEYS: (2) 5-4-003:28 por. and (2) 5-4-017:44 por.

RECEIVED
19 AUG -7 P3:49
OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

The State of Hawaii Department of Transportation hereby transmits the Final Environmental Assessment and Finding of No Significant Impact (FEA-FONSI) for the subject project. Please publish in the next available edition of the *Office of Environmental Quality Control (OEQC) Environmental Notice*.

Enclosed is a completed OEQC Publication Form, one hard copy of the FEA-FONSI, a PDF file of the same, and the publication form in Microsoft Word. Also included are copies of comments and responses that were received during the 30-day public comment period on the Draft Environmental Assessment and Anticipated Finding of No Significant Impact.

Should you have any questions, please contact Justin Rush of our Design Section, Design Branch, Highways Division at (808) 692-8427 or by email at justin.se.rush@hawaii.gov and reference letter number HWY-DD 2.8288 as noted above.

Enclosures

c: Scott Suzuki (Mitsunaga & Associates, Inc.)

20-041

AGENCY PUBLICATION FORM

Project Name:	Makakupaia Bridge Stream Replacement, Molokai, Hawaii, Project No. STP-0450(010)
Project Short Name:	Makakupaia Bridge Replacement
HRS §343-5 Trigger(s):	Use of state lands and funds
Island(s):	Molokai
Judicial District(s):	Kona District
TMK(s):	Highway right-of-way bordering TMK(2)5-4-017- various and 5-4-003- various
Permit(s)/Approval(s):	National Pollutant Discharge Elimination System (NPDES), State of Hawaii DBEDT-Coastal Zone Management Federal Consistency, State of Hawaii DLNR-Section 106 National Historic Preservation Act Compliance, State of Hawaii DOH Noise Permit/Variance, County of Maui-Special Management Area
Proposing/Determining Agency:	State of Hawaii Department of Transportation
Contact Name, Email, Telephone, Address	Justin Rush, justin.se.rush@hawaii.gov , 808-692-8427 State of Hawaii, Department of Transportation, 601 Kamokila Boulevard, Room 609, Kapolei, HI 96707
Accepting Authority:	(for EIS submittals only)
Contact Name, Email, Telephone, Address	
Consultant:	EKNA Services, Inc.
Contact Name, Email, Telephone, Address	Elaine Tamaye, etamaye@eknahawaii.com , 808-591-8553 ext 204 615 Piikoi St., Suite 300, Honolulu, HI 96814

Status (select one)☐ DEA-AFNSI☒ FEA-FONSI☐ FEA-EISPN☐ Act 172-12 EISPN
("Direct to EIS")☐ DEIS☐ FEIS☐ FEIS Acceptance
Determination☐ FEIS Statutory
Acceptance☐ Supplemental EIS
Determination**Submittal Requirements**

Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.

Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.

Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.

Submit 1) the proposing agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.

Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.

Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.

The accepting authority simultaneously transmits to both the OEQC and the proposing agency a letter of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS; no comment period ensues upon publication in the Notice.

Timely statutory acceptance of the FEIS under Section 343-5(c), HRS, is not applicable to agency actions.

The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and

determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.

____ Withdrawal Identify the specific document(s) to withdraw and explain in the project summary section.

____ Other Contact the OEQC if your action is not one of the above items.

Project Summary

Provide a description of the proposed action and purpose and need in 200 words or less.

The State of Hawaii Department of Transportation (HDOT) proposes to replace Makakupaia Bridge, located about 4 miles east of Kaunakakai town on Kamehameha V Highway (Route 450). The bridge was built in 1940 and is approximately 23 feet long and 28 feet wide and currently has two 11-foot lanes with 2-foot shoulders. The HDOT is proposing to demolish the existing bridge and construct a new bridge that will conform to current HDOT and American Association of State Highway and Transportation Officials and Federal Highway Administration standards. The replacement bridge will be a two-lane bridge with widened shoulders for pedestrians and cyclists. The new bridge will be 49 feet long by approximately 42 feet wide, and will be entirely within the existing highway right-of-way. A temporary bypass road will be constructed on the mauka side to allow traffic to remain open during construction. The bypass road will be removed after completion of the new bridge. A contractor staging area is located on the mauka side of the highway, east of the bridge.

Final Environmental Assessment

Makakupaia Bridge Replacement Molokai, Hawaii

Prepared for:

**State of Hawaii
Department of Transportation**

May 2019

Prepared by:

EKNA Services, Inc.

Project Summary

Project Name:	Replacement of Makakupaia Bridge
Location:	Island of Molokai Kamehameha V Highway (Route 450) Milepost 3.94 in Kawela
Project Site Tax Map Key:	Highway right-of-way bordering TMK (2) 5-4-017-various and 5-4-003-various, temporary bypass road and contractor staging area located on TMK (2) 5-4-003:028
Project Site Existing Uses:	Existing two-lane highway corridor. Land uses that abut the corridor in the vicinity include park/open space and residential.
Project Site Existing Land Use Designations:	After construction, project will be fully within the existing state highway right-of-way. Land uses that abut project: <u>State Land Use</u> : Urban (south side), Agricultural (north side) <u>Special Management Area</u> : Yes <u>Molokai Community Plan</u> : Single Family (south side), Agriculture (north side)
Proposed Action:	<p>The State of Hawaii Department of Transportation (HDOT) proposes to replace Makakupaia Bridge, located about 4 miles east of Kaunakakai town on Kamehameha V Highway. The highway follows the southeastern coastline from Kaunakakai to Halawa. The two-lane undivided highway does not have a designated bike lane. The existing bridge is approximately 23 feet long and 28 feet wide.</p> <p>The HDOT is proposing to demolish the existing bridge and construct a new bridge that will conform to current HDOT/AASHTO and FHWA design guidelines. The new bridge will be supported on drilled shafts (the existing abutments will be left in place to avoid impacts to the existing stream). The replacement bridge will be a two-lane bridge with widened shoulders for pedestrians and cyclists. A temporary bypass road will be constructed on the mauka side to allow traffic to remain open during construction.</p>

Anticipated Impacts:	<p>Impacts will be associated with construction activities:</p> <ul style="list-style-type: none"> • Noise (temporary) • Removal of vegetation (temporary bypass road and contractor staging area) • Utility relocations • Traffic detours (temporary) <p>The project will not change the capacity of the highway, therefore, long-term impacts are expected to be minimal.</p>
NEPA and HRS Chapter 343 Proposing Agency:	<p>State of Hawaii Department of Transportation 869 Punchbowl Street, Honolulu, Hawaii Director of Transportation</p>
HRS Chapter 343 Accepting Authority:	<p>State of Hawaii Department of Transportation 869 Punchbowl Street, Honolulu, Hawaii Director of Transportation</p>
Anticipated Determination:	<p>Finding of No Significant Impact (FONSI)</p>
Project Site Permits/Approvals Required (refer to Chap. 3 for more information):	<ul style="list-style-type: none"> • National Pollutant Discharge Elimination System (NPDES) • State of Hawaii DBEDT - Coastal Zone Management Federal Consistency • State of Hawaii DOH Noise Permit/Variance • County of Maui - Special Management Area

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1. Location Map
2. Photos of Bridge Approaches
3. Photos of Mauka and Makai Areas
4. Photos of Beach Fronting the Makakupaia Stream
5. Area of Potential Effect
6. Tax Map Key: (2) 5-4-003
7. Tax Map Key: (2) 5-4-017
8. Topographic Survey
9. Soil Designation Map
10. FEMA Flood Insurance Rate Map
11. State Land Use District Designation
12. Community Plan Land Use Designations
13. Special Management Area Map

APPENDICES

Appendix A - Environmental Surveys of Makakupaia Stream and Vicinity for the Makakupaia Bridge Replacement Project Near Kawela, Molokai

Appendix B - Archaeological Assessment for Makakupaia Bridge Replacement Project, Kawela Ahupuaa, Kona District, Island of Molokai

Appendix C - NHPA Section 106 Documentation

Appendix D - Coordination, Comment and Response Letters

CHAPTER 1 - PROJECT DESCRIPTION

1.1 Project Purpose and Need

The State of Hawaii Department of Transportation (HDOT) proposes to replace Makakupaia Bridge, located about 4 miles east of Kaunakakai town on Kamehameha V Highway (Route 450). The two-lane undivided highway does not have a designated bike lane. From the *Routine (Periodic) Bridge Inspection Report*, dated January 2010 for Makakupaia Bridge, the bridge's sufficiency rating is classified as functionally obsolete and it is suggested that the bridge railings, guardrails, and guardrail end treatments be upgraded.

The HDOT is proposing to demolish the existing bridge and construct a new bridge that will conform to current HDOT and American Association of State Highway and Transportation Officials (AASHTO) *Policy on Geometric Design 2011* and Federal Highway Administration (FHWA) guidelines. The replacement bridge would be a two-lane bridge with widened shoulders for pedestrians and cyclists.

This environmental assessment is prepared pursuant to Chapter 343, Hawaii Revised Statutes as amended, and in accordance with Chapter 200 of Title 11, Department of Health Administrative Rules, *Environmental Impact Statement Rules*. This document addresses the potential physical and social effects on the environment by the proposed project, and mitigative measures as necessary.

1.2 Location and Existing Conditions

Makakupaia Bridge is located at approximately Milepost 3.94 on Kamehameha V Highway (Route 450), east of Kaunakakai. See **Exhibit 1 Location Map**. Kamehameha V Highway is the only thoroughfare between Kaunakakai and Halawa on the south shore of Molokai. The highway is not on the National Highway System and is functionally classified as a Major Collector. With a posted speed limit of 35 mph, the bridge roadway currently has two 11-foot lanes and is undivided with 2-foot shoulders on each side for a total width of 26 feet (curb to curb). See **Exhibit 2 Photos of Bridge Approaches**.

The existing bridge allows rainfall runoff from the mauka area to drain under the highway into a stream on the makai side of the road. Rainfall runoff on the makai side of the road in the vicinity of the bridge is channeled by concrete lined swales that also drain into the stream. See **Exhibit 3 Photos of Mauka and Makai Areas**. The stream is fronted by a sand beach. See **Exhibit 4 Photos of Beach Fronting the Makakupaia Stream**.

A temporary bypass road will be constructed on the mauka (north) side of the bridge. This portion of the parcel is undeveloped and owned by Kawela Plantation. There will be no construction on the south side of the bridge outside of the highway right-of-way. The south side of the highway in the vicinity of the bridge is comprised of residential parcels.

1.3 Description of the Proposed Project

The proposed new bridge would be 49 feet long by 42 feet wide, with two 12-foot wide traffic lanes and two 8-foot wide shoulders. The 42-foot width of the bridge is the width measured to the outside edges of the concrete deck.

The replacement bridge would be constructed entirely within the highway right-of-way. A temporary bypass road would be on the mauka side of the highway on privately-owned land and would require a construction parcel from the landowner. The bypass road would be removed after completion of the new bridge. A contractor staging area is also located on the mauka side of the highway, east of the bridge. See **Exhibit 5 Area of Potential Effect**.

The alignment of the bypass road outside of the highway right-of-way is at the edge of existing kiawe forest. The bypass road would be approximately 600 feet long, with two 11-foot wide lanes and two 4-foot shoulders. For the residential parcels on the makai side of the highway, access would be provided within the highway right-of-way, but outside of the areas directly affected by construction activities.

1.4 Project Duration and Estimated Cost

Total duration for construction would be approximately 18-24 months, including the construction/removal of the temporary bypass road, demolition of the existing bridge, construction of the new bridge, and associated road work on the approaches to the new bridge. Estimated construction cost is \$8.5 million.

1.5 Required Permits and Approvals

Various local, state and federal permits and approvals are required for the proposed project:

Federal Government:

- Endangered Species Act, Section 7 Coordination
- National Historic Preservation Act, Section 106 Coordination
- National Marine Fisheries Service and Essential Fish Habitat Coordination
- Section 404 permit

State of Hawaii:

- Coastal Zone Management Federal Consistency Determination
- Chapter 6E-8 Review
- Chapter 195D review
- National Pollutant Discharge Elimination System General Permit - Notice of Intent, Form C (Stormwater Associated with Construction Activity)

Maui County:

- Special Management Area Use Permit

CHAPTER 2 - AFFECTED ENVIRONMENT, ANTICIPATED EFFECTS AND PROPOSED MITIGATIVE MEASURES

2.1 Physical Environment

2.1.1 Land ownership and tenancy

Makakupaia Bridge is located on Kamehameha V Highway within the highway right-of-way, TMK:(2) 5-4-003 (**Exhibit 6**) and TMK:(2) 5-4-017 (**Exhibit 7**). The new replacement bridge would be constructed entirely within the 80-foot highway right-of-way, however, the temporary bypass road would be outside of the highway right-of-way on the immediate mauka side of the existing bridge. A temporary construction parcel would be required from the property owner of TMK:(2) 5-4-003:028. No residences are directly impacted by the bypass road and contractor staging area.

Other properties located in the vicinity of the work may be indirectly affected by the detoured traffic and the construction activities near the bridge. These properties include TMK:(2) 5-4-003:034 and 035 located on the north side of the highway and TMK:(2) 5-4-017:027, 026, 025, 024, 023, 022, 021, 045, 044, 017, 018, 019, 020, 016, 015, 014, 013, 056, 055, 054, all located on the south side of the highway.

Mitigative Measures: Access to all properties would need to be maintained during construction.

2.1.2 Topography and soils

Makakupaia Bridge is located on the south central coast of Molokai, near sea level. Elevation of the bridge roadway is about 6 feet above mean seal level. Ground elevation on the makai side of the bridge along the top edge of the stream channel is about 5 feet above MSL. See **Exhibit 8 Topographic Survey**.

Soils in the vicinity of the project site are classified by the U.S. Department of Agriculture, Natural Resources Conservation Service, as being Type MmA, Mala silty clay, 0 to 3 percent slopes. These soils are developed in alluvial fans, are well-drained, with low runoff. See **Exhibit 9 Soil Designation Map**.

The State Department of Agriculture has established categories of Agricultural Lands of Importance to the State of Hawaii. Various areas on Molokai have been classified as “Prime” and “Other Important Agricultural Land”, primarily on the western half of the island. Makakupaia Bridge and vicinity is situated on unclassified lands.

Mitigative Measures: The new bridge and approach roadways would maintain the existing alignment, therefore no adverse impacts to existing topography or soils is anticipated. The temporary bypass road would require removal of existing vegetation

(kiawe) within the alignment. However, no major grading would be required and existing topography would be restored after removal of the bypass road.

2.1.3 Flood and Tsunami Hazards

The project site is located in a flood hazard area identified as Zone AE by the Federal Emergency Management Agency (FEMA). Flood Insurance Rate Map (FIRM) Map Number 1500030194F, revision dated November 4, 2015, identifies this flood zone as a special flood hazard area (coastal flooding) with a base flood elevation (BFE) of 7 feet at the project site. See **Exhibit 10 FEMA Flood Insurance Rate Map**. The roadway elevation of the existing bridge and approaches is approximately 6 feet, which is below the BFE. The top deck elevation of the new bridge may be slightly higher than existing, but will not affect the flood zone designation.

FEMA's FIRM does not identify this coastal area as a VE Zone subject to a 100-year tsunami flood event with high velocity flows. However, Kamehameha V Highway along the south central coast of Molokai is situated in the tsunami evacuation zone according to the proposed Molokai Community Plan Update dated November 2015. The Makakupaia Bridge project would not change this designation.

Mitigative Measures: No mitigation is required.

2.1.4 Water Resources and Hydrology

The drainageway called Makakupaia does not appear as a named stream on maps produced by the United States Geological Survey, the agency which collects information and produces maps, data, and publications on the nation's water resources. Historic flow data was not found. However, the State of Hawaii Department of Health (DOH) identifies Makakupaia as a Class 2 stream, which includes intermittent streams and man-made ditches.

On the mauka (north) side of the bridge, there is no defined stream bank. Rainfall runoff from the mauka slopes collect in a depressed area on the north side of the highway and drains under the bridge into a lined stream. This stream extends approximately 350 feet through the residential parcels on the west side of Kanoa Fishpond. The stream has no outlet to the ocean and is fronted by a vegetated sand beach. While it is possible that water from the stream may infrequently overflow its banks and the beach berm during heavy rainfall events, there is no formal documentation of these occurrences.

The U.S. Army Corps of Engineers (Corps) has determined that the stream may be subject to regulatory jurisdiction as non-wetland waters under Section 404 (Notification of Preliminary Jurisdictional Determination (PJD) dated June 7, 2018, DA File No. POH-2016-00123). Removal of the existing concrete bridge and construction of the new bridge requires no work within the Corps PJD boundary of the stream. Construction involves no dredge or fill activity within the PJD boundary, and construction BMPs will prevent any

construction-related discharge to the stream. Therefore, it is anticipated that a “no permit required” determination will be obtained from the Corps.

The south coast of Molokai is listed as a Water Quality Limited Segment by the DOH. This means that the water body does not meet the Hawaii water quality standards for this Class AA Marine Waters.

Mitigative Measures: Best Management Practices will be implemented during the construction phase to prevent construction site runoff from entering the stream and coastal waters. Construction will be phased to avoid periods when high rainfall/runoff events will be likely. No long-term adverse effects are anticipated on the hydrology and water resources from the replacement of the existing bridge. The hydraulic capacity of the stream will be unchanged.

2.1.5 Flora and fauna

Surveys of the flora and fauna were conducted by AECOS, Inc. (See **Appendix A report**). In total, 43 flowering plants were recorded (no ferns or conifers). Of these 43 species, three species were cultivated or ornamental plants, six are considered to be species native to the Hawaiian Islands (indigenous; no endemic plants were observed), and one is an early Polynesian introduction (so-called “canoe plant”). No species of particular conservation interest or resource value occur. No botanical resources protected or proposed for protection under state or federal statutes were observed in the area.

The two mammals confirmed to utilize the project area (axis deer and feral pig) and 16 of the 19 bird species observed during the survey are introduced or alien species. The three native birds (*kolea*, *aeo*, and *aukuu*) are protected under the Migratory Bird Treaty Act (MBTA). Six of the introduced species (Northern Cardinal, Cattle Egret, Mallard Duck, Western Meadowlark, Northern Mockingbird and House Finch) are also protected under the MBTA. All other introduced bird species and the mammals are not afforded special protections. *Aeo* or Hawaiian stilt is a waterbird that is listed as endangered by both federal and state statutes. *Aukuu* or Black-crowned Night Heron is an indigenous water-obligate species that is commonly encountered close to just about any type of standing or running water across the state and is listed as endangered by state statute. *Kolea* or Pacific Golden Plover is an indigenous migratory bird that nests in the high Arctic during the late spring and summer months and returns to Hawaii to spend the fall and winter months. The project, as proposed, is not likely to have adverse effects on *kolea*, *aeo*, or *aukuu* populations or habitat.

No aquatic species (other than birds) listed as endangered or threatened under federal and state statutes were observed in Makakupaia stream within the project vicinity.

Opeapea or Hawaiian hoary bat is the only endemic land mammal in Hawaii and is listed as endangered under federal and state statutes. *Opeapea* have been documented in Molokai forests in Kalaupapa National Historic Park and Palaaau State Park. Two other

confirmed sightings, one over the ocean along the southern shore and another in a residence occurred in Kamalo. *Opeapea* may fly over the area on occasion and the kiawe forest in the project area may have limited value as roosting habitat. During the pupping season, females carrying pups may be reluctant to vacate a roost site if a pup is present and very small pups may be unable to flee a tree that is being felled. If large trees are not cut or are cut outside of the pupping season, the project will likely not affect *opeapea*.

There is no federally delineated critical habitat for any species present on, adjacent, or in the vicinity of the project. Thus, the modification of the habitat on all or any part of the site will not result in impacts to federally designated critical habitat.

Mitigative Measures: The USFWS has provided the following recommendations in their letter concurring with FHWA's "may affect, but not likely to adversely affect" determination. Implementation of these recommendations will minimize impact to *aeo* and other ESA-listed waterbird species.

Hawaiian Hoary Bat

The potential impact that the construction and operation of the proposed project poses to the bats is the clearing and grubbing of vegetation. The removal of vegetation within the project site may temporarily displace individual bats and roosting locations. During the pupping season, female bats will at times leave the roost to forage, leaving the pups unattended and unable to flee if the tree were felled. Additionally, Hawaiian hoary bats forage for insects from as low as three feet to higher than 500 feet above the ground. The kiawe forest in the project area may have limited value as roosting habitat but the species has been documented to roost in kiawe trees. The temporary bypass road and the contractor's staging area require clearing small areas of the kiawe forest adjacent to the highway. To avoid potential adverse effects to bats:

- Woody plants greater than 15 feet tall will not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15).
- Barbed wire will not be used for fencing.

Nene

Nene are found on the islands of Hawaii, Maui, Molokai, and Kauai predominately, with a small population on Oahu. They are observed in a variety of habitats, but prefer open areas, such as pastures, golf courses, wetlands, natural grasslands and shrublands, and lava flows. Threats to the species include introduced mammalian and avian predators, wind facilities, and vehicle strikes. To avoid potential adverse effects to nene:

- Nene will not be approached, fed, or otherwise disturbed.
- If nene are observed loafing or foraging within the project area during the nene breeding season (September 1 through April 30), a biologist familiar with the nesting behavior of nene will survey for nests in and around the project area prior to the resumption of any work.
- Surveys will be repeated after any subsequent delay of work of three or more days (during which the birds may attempt to nest).

- If a nest is discovered within a radius of 150 feet of proposed work, or a previously undiscovered nest is found within said radius after work begins, all work will cease immediately and the USFWS will be contacted for further guidance.
- In areas where nene are known to be present, reduced speed limits will be posted and implemented, and project personnel and contractors informed about the presence of endangered species on-site.

Seabirds

Hawaiian petrels, Band-rumped storm petrels, and the threatened Newell's shearwater (collectively known as seabirds) may traverse the project area at night during the breeding season (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable. To avoid potential adverse effects to seabirds:

- All outdoor lights will be fully shielded so the bulb can only be seen from below bulb height and only used when necessary.
- Automatic motion sensor switches and controls will be installed on all outdoor lights or lights will be turned off when human activity is not occurring in the lighted area.
- Nighttime construction will be avoided during the seabird fledging period, September 15 through December 15.
- If night-time construction or equipment maintenance activity is unavoidable, all associated lights will be shielded, and when large flood/work lights are used, they will be placed on poles that are high enough to allow the lights to be pointed directly downward at the ground.
- No street lights are being installed in conjunction with this project.

Waterbirds

Hawaiian coot, Hawaiian common moorhen, and Hawaiian stilt (collectively known as waterbirds) may occur in in fresh and brackish water. The Hawaiian waterbirds may use the vicinity of the proposed project for loafing, foraging, and possibly nesting. If a nest is present, potential impacts include parents being flushed from the nest for extended periods of time causing the nest to fail or eggs or chicks being crushed by humans or equipment. To avoid potential adverse effects to waterbirds:

- In areas where waterbirds are known to be present, reduced speed limits will be posted and implemented, and project personnel and contractors informed about the presence of endangered species on-site.
- A biological monitor that is familiar with the species' biology will conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation.

- Surveys will be repeated again within three days of project initiation and after any subsequent delay of work of three or more days (during which the birds may attempt to nest). If a nest or active brood is found:
 - The USFWS will be contacted within 48 hours for further guidance.
 - A 100-foot buffer will be established and maintained around all active nests and/or broods until the chicks/ducklings have fledged. No potentially disruptive activities or habitat alteration will occur within this buffer.
 - A biological monitor that is familiar with the species' biology will be present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

Sea Turtles

The bridge is located approximately 350 feet from the coast, and the project will not affect the nearby beach or coastal waters. The existing houses and vegetation on the makai side of the highway will block construction lighting from reaching the beaches, and therefore lights from the project will have minimal potential for impacting sea turtles. This coastal area is not known to be a nesting site for sea turtles. Additionally, if night-time construction or equipment maintenance activity is unavoidable, all associated lights will be shielded, and when large flood/work lights are used, they will be placed on poles that are high enough to allow the lights to be pointed directly downward at the ground. To avoid potential adverse effects to sea turtles and their nests:

- No vehicle use on or modification of the beach/dune environment during the sea turtle nesting or hatching season (May 1 to December 31).
- Do not remove native dune vegetation.
- A biologist familiar with sea turtles will conduct a visual survey of the project site to ensure no basking sea turtles are present.
 - If a basking sea turtle is found within the project area, cease all mechanical or construction activities within 100 feet until the animal voluntarily leaves the area.
 - Cease all activities between the basking turtle and the ocean.
- Remove any project-related debris, trash, or equipment from the beach or dune if not actively being used.
- Do not stockpile project-related materials in the intertidal zone, reef flats, or stream channels.

The USFWS's recommended Best Management Practices regarding soil erosion and sedimentation of aquatic environments will be implemented to minimize impacts to listed species.

2.1.6 Historic, archaeological and cultural resources

An Archaeological Assessment was conducted by Pacific Legacy, Inc. (See **Appendix B report**). The purpose was to determine if any significant archaeological sites or cultural

resources were within the APE. A 100 percent surface (pedestrian) survey was conducted within the APE and eight backhoe trenches were excavated and monitored. No surface archaeological resources or cultural deposits were identified by the surface survey. No historic or traditional cultural material, subsurface archaeological features, or human remains were encountered in any of the excavation trenches. Because of the lack of any cultural resources being identified within the APE and the very low potential to encounter any cultural resources, the archaeological consultant recommends that no archaeological monitoring be required during construction.

Pacific Legacy also researched traditional accounts and conducted historic background research. Previous archaeological work conducted on the island and in the vicinity of the project area were also reviewed. Previous archaeological investigations in the vicinity of the project area identified several historic sites, but none are potentially impacted by the proposed project, and no human skeletal remains were found.

Consultation with agencies, Native Hawaiian organizations, groups and individuals was conducted to obtain information or concerns for historical, archaeological or cultural resources in the project area. See **Appendix C, NHPA Section 106 Consultation**. No concerns were raised regarding the replacement of the existing bridge.

According to the 2013 Hawaii State Historic Bridge Inventory and Evaluation (bridge inventory), the bridge is considered eligible for the State Register as a good example of a 1940s reinforced concrete flat slab bridge and associated with early developments in concrete bridge construction in Hawaii (Criterion C). The bridge inventory states, “workmanship of the bridge has not been obscured by additions or repairs” (MKE Associates LLC, Fung Associates, Inc. 2013:5-116). Contrary to the bridge inventory, significant upgrades to the bridge were completed between 1978 and 2014 that include modifications and additions to the concrete railings, replacement of the end posts, installation of guardrails, and conversion of the concrete deck to asphalt, affecting the historical characteristic of the bridge to where it is not a true representation of a 1940s concrete flat slab bridge.

A Historic Property Evaluation was recently completed on the bridge and was submitted concurrently with a determination letter from HDOT to the SHPD of “no historic properties affected” (letter dated November 20, 2018). A determination letter was also submitted from the FHWA to the SHPD of “no historic properties affected” (letter dated December 6, 2018). The historic property evaluation concluded, “Modifications detract from the historic integrity of the original parapet the bridge’s most visible feature: The addition of concrete raised its height from roughly 2’ to 2’-8” and obscured its original edge details and some of the original board-formed concrete. The curving end sections added to the parapet in 1979 differ in design and feeling from the original linear parapet

design. These changes result in a lack of integrity of design, feeling, workmanship and association that preclude eligibility for the State and National Registers.” The SHPD concurred with HDOT and the FHWA’s “no historic properties affected” determination by letters dated January 15, 2019.

Mitigative Measures: Because of the lack of any traditional or early historic cultural resources being identified within the APE and the very low potential to encounter any cultural resources, no archaeological monitoring is planned for the proposed construction. However, in the unlikely event that potentially significant cultural resources, including human skeletal remains, are encountered during construction, work in the immediate area of the finding will be halted and the SHPD Maui archaeologist and Maui Police Department notified.

2.1.7 Regional climate and air quality

Weather data collected at the Molokai Airport characterizes the regional climate as tropical savanna with dry winters. Average daily high temperature varies from 77°F in the winter to 85°F in the summer. Average daily low temperature varies from 64°F in the winter to 72°F in the summer. Average monthly rainfall varies from about ½ inch during the summer to about 4 inches during the winter. Weather on the western side of the island tends to be drier, while the high plateau on the eastern side is wetter.

Regional winds are dominated by the tradewinds, with average wind speeds of about 9 to 14 mph, and daily maximum winds of 15-20 mph. On the south central coast in the vicinity of the project site, winds are typically from the east as the tradewinds wrap around the eastern end of the island. Winds are influenced by the heating and cooling of the island, being lighter in the mornings and more brisk in the afternoons.

There are no existing air pollution sources in the vicinity of the project site and no stationary sources of air pollution in the area. Operation of construction equipment, and construction activities, will create temporary dust and exhaust emissions. Construction equipment exhaust emissions will be controlled by adherence to the requirements of the Department of Health Administrative Rules (Title 11, Chapters 59 and 60 regarding Air Pollution Control).

Mitigative Measures: Best Management Practices (BMPs) will be implemented during the construction phase to mitigate dust during construction using measures such as water sprinkling. No long-term adverse effects are anticipated because the project will not affect the climatic conditions in the area, and does not include permanent sources of air pollution.

2.1.8 Noise levels

Molokai is a rural community with no noise-generating sources in the vicinity of the project. The project will not result in long-term impacts to ambient noise levels, although there will be some local noise increase during construction due to operation of heavy equipment. Construction work is not anticipated to be done on weekends. Contractor equipment is required to meet Department of Health noise regulations (Title 11, Chapter 46, Community Noise Control).

Mitigative Measures: BMPs will be implemented during the construction phase to mitigate construction-generated noise, and work activities will be limited to daylight hours only. Replacement of the existing bridge will not cause increased noise-generating traffic.

2.1.9 Aesthetics and view planes

Molokai's rural nature lends itself to scenic resources, with views of open space, forested mountains, and ocean coastlines. The project site is located near Milepost 3.94 on Kamehameha V Highway, on the southwest coastline. The bridge itself is situated about 400 feet inland from the beach, and the residential development obscures views of the ocean. Replacement of the existing bridge will not impact existing view planes and will not affect scenic resources.

Mitigative Measures: No mitigation is required.

2.2 Socio-Economic Environment

2.2.1 Population and Economy

The resident population of Molokai was 7,255 based on the 2010 census count. While this was a small 2% decline from the 2000 census, the population is forecasted to moderately increase at an annual rate of 1% for the next 20 years according to Maui County's *Socio-Economic Forecast Report*. The average daily resident and visitor population in 2010 was approximately one visitor for every 12 residents, and the State of Hawaii Department of Business, Economic Development and Tourism forecast through 2035 is for this ratio to remain relatively unchanged.

According to the *Molokai Community Plan Update* (May 2016 Draft), the high cost of living and limited economic activity is one of the most significant problems facing the community. An issue paper prepared for the Draft Update states that Molokai has lower incomes, higher unemployment rates, and a higher number of people receiving public

assistance when compared statewide. The availability of workforce housing, ownership and rental, and the variety of housing types on the island are limited.

While the project will have short-term economic benefit associated with construction expenditures, there are no anticipated long-term impacts on the population or economy.

Mitigative Measures: No mitigation is required.

2.2.2 Recreational facilities

Molokai offers a wide range of outdoor recreational opportunities, including bicycling, boating, camping, diving, fishing, hiking, hunting, surfing, and swimming. Alii Beach Park is located about half a mile west of the project site along Kamehameha V Highway. Kaunakakai Harbor is about four miles west in the town of Kaunakakai, offering moorings for recreational small craft and charter vessels, and boat launching ramp.

The existing bridge does not have a dedicated bicycle lane. The replacement bridge will provide widened shoulders for joggers and cyclists currently using the highway shoulders.

Mitigative Measures: No mitigation is required.

2.2.3 Police, fire and medical services

The Maui County Police Department's Molokai station is located in Kaunakakai. The Maui County Department of Fire and Public Safety maintains stations in Kaunakakai and Hoolehua, with a substation in Pukoo. Molokai General Hospital, which is operated by the Queen's Health Systems, is the only major medical facility on Molokai.

By replacing the existing bridge to meet current design guidelines, the project will enable emergency service providers to respond to emergencies in a safer manner.

Mitigative Measures: No mitigation is required.

2.2.4 Transportation facilities

The State of Hawaii owns and maintains the major highway extending from the west end of Molokai (Kaluakoi) to the east end (Halawa), and over the central portion of the island to Kalaupapa. Maunaloa Highway (Route 460) on the west end becomes Kamehameha V Highway (Route 450) in Kaunakakai town. Makakupaia Bridge is located at approximately Milepost 3.94 on Kamehameha V Highway east of Kaunakakai.

Average daily traffic in 2016 along this section of highway was 3,700 cars. For design purposes, average daily traffic for 2036 is estimated at 5,200 cars. The replacement of Makakupaia Bridge will provide continued safe transportation access on Kamehameha V Highway.

Mitigative Measures: No mitigation is required.

2.2.5 Environmental Justice

Federal Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, requires federal agencies to take necessary steps to identify and avoid any disproportionate negative effects on minority and low-income population. Since the project is federally funded, compliance with EO 12898 is required. This project involves the replacement of an existing bridge in order to maintain safe public transportation access for the entire population. Therefore, it will not disproportionately affect minority or low-income populations. Any short-term construction impacts will affect the entire population served by the highway.

Mitigative Measures: No mitigation is required.

CHAPTER 3 - RELATIONSHIP TO GOVERNMENTAL PLANS AND POLICIES

3.1 State Land Use

The State Land Use Law classifies all state lands as urban, rural, agricultural or conservation. In the vicinity of the proposed project, lands seaward of the highway are designated as “Urban”, and the mauka side of the highway is designated as “Agriculture”. The fishponds along the coast are designated “Conservation”. See **Exhibit 11 State Land Use District Designation**.

The *Hawaii State Plan* provides long-range planning objectives and policies for the State. The proposed project conforms to the following State objectives:

- Facilities Systems - in General. Accommodate the needs of Hawaii’s people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.
- Facilities Systems - Transportation. Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii’s natural environment.

3.2 County Zoning and Development Plan

The Maui County General Plan (1990 Update) sets forth broad objectives and policies to help guide the development of the County. The proposed project conforms to the objectives and policies for Transportation.

The County of Maui General Plan consists of the Countywide Policy Plan, the Maui Island Plan, and the nine community plans (Molokai, Lanai, Kahoolawe, and Maui with 6 communities). The Molokai Community Plan (2001) sets forth goals, objectives and policies for a number of functional areas. The proposed project conforms to the following objectives and policies for Transportation:

- Maintain the East End Highway (Kamehameha V Highway) at its current pavement width except for blind turns or other places necessary for public safety.
- Provide and maintain safe pedestrian trails, bikeways, jogging paths and equestrian trails along highways.

The Molokai Community Plan also sets forth desired land use patterns, and the Central Molokai Community Plan (approved 3-7-07) designates the lands on the makai (south) side of the highway as “Single Family”, and lands on the mauka (north) side of the highway as “Agriculture”. The Makakupaia Stream on the makai side of the bridge is designated “Open

Space”, and Kamehameha V Highway is designated as “Roads”. See **Exhibit 12 Community Plan Land Use Designations**. The proposed project will be built entirely within the existing highway right-of-way. The temporary bypass road will be built on lands on the north side of the highway, but will be removed after completion of the new replacement bridge and the land restored to its natural condition to the extent practicable.

The Molokai Community Plan is in the process of being updated, and the May 2016 draft of the plan has been prepared for Maui County Council’s review and adoption. The proposed updated Community Plan Land Use for the vicinity of the proposed project remains unchanged. The updated plan designates the entire length of Kamehameha V Highway along the south central coast as situated within the Tsunami Evacuation Zone.

3.3 Special Management Area and Coastal Zone Management

The project site is located within the Special Management Area (SMA). See **Exhibit 13 Special Management Area Map**. The SMA is mandated under HRS Chapter 205A - Coastal Zone Management, which authorizes the counties to establish SMAs to protect and preserve the coastal zone in Hawaii. Generally, development activities require an SMA permit. Although road repair and maintenance in the highway right-of-way is exempt from an SMA permit, because the bridge will be replaced with a completely new structure, a permit may be required. In addition, the temporary bypass road would be within the SMA.

Federal activities, including projects financially assisted by the federal government that directly affect Hawaii’s coastal zone, including all land, waters and marine waters, require reviews for consistency with Hawaii’s Coastal Zone Management (CZM) Program set forth in HRS Chapter 205A-2. This project is partially funded by the Federal Highway Administration, thus, a review of the project for its consistency with Hawaii’s CZM Program would be conducted by the State CZM Program administered by DBEDT Office of Planning. The CZM Program objectives and policies address recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection and marine resources. The proposed project is not anticipated to result in adverse impacts as summarized below:

- *Affects natural or cultural resources (i.e. historic site, excavation on vacant land).* The project involves the replacement of an existing bridge. The bridge was built in 1940 and significant upgrades were completed between 1978 and 2014. A recent Historic Property Evaluation concluded that the changes due to the modifications “result in a lack of integrity of design, feeling, workmanship and association that preclude eligibility for the State and National Registers”. The SHPD concurred with HDOT and the FHWA’s “no historic properties affected” determination. An archaeological assessment conducted within the area of potential effect revealed no archaeological or cultural sites within or

near the project site.

- *Curtails the range of beneficial uses of the environment.* The proposed project would not affect the beneficial use of the existing highway and surrounding environment.
- *Conflicts with the county's or the state's long-term environmental policies or goals (i.e. State Plan, County General Plan and Community Plan).* The proposed project would not conflict with the long-term environmental policies or goals of the State Plan, County General Plan and Community Plan.
- *Affects the economic or social welfare and activities of the community, county, or state.* The proposed project would provide a short-term economic benefit to the community during the construction phase. There are no adverse long-term economic or social welfare impacts associated with the proposed project. Maintenance of the highway contributes to the economic and social welfare of the community and State.
- *Involves secondary impacts, such as population changes (i.e. increase/decrease) and increased effects on public facilities, streets, drainage, sewage, and water systems, and pedestrian walkways (i.e. increased demands and deficiencies).* The proposed project would not alter the present location or capacity of the highway and will not cause substantial secondary impacts.
- *By itself has no significant adverse effects but cumulatively has considerable effect upon the environment (i.e. increased traffic and deficiencies in services) or involves a commitment for larger actions (i.e. more public infrastructure such as roads, waterlines, sewers, etc.).* The proposed project is not part of or linked to any larger action. The proposed project involves replacement of an existing bridge within the highway right-of-way. The replacement bridge would not alter the present capacity of the highway.
- *Affects a rare, threatened, or endangered species of animal or plant, or its habitat (i.e. wetlands, natural area reserve, refuge).* No impacts are anticipated on any candidate, proposed or listed endangered species or their habitats, and none are known to exist within the project limits.
- *Is contrary to the state plan, county's general plan, appropriate community plans, zoning and subdivision ordinances.* The proposed project involves replacement of an existing bridge in the highway right-of-way, and is consistent with the State plan, county general plan and community plan.

- *Affects air or water quality or ambient noise levels (i.e. construction impacts). How might any effects be mitigated?* Construction activities would have short-term impacts to air and noise quality from construction equipment noise, emissions and fugitive dust. Construction-related impacts would be controlled and mitigated by utilizing BMPs and adhering to state and county rules regarding construction practices. Upon completion of construction activities, air and ambient noise levels would revert to prior levels. BMPs would be utilized to prevent project site runoff from reaching coastal waters.
- *Located in and does it affect an environmentally sensitive area, such as flood plain, shoreline, dunes, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh waters, or coastal waters.* Kamehameha V Highway in the vicinity of the project site is located in a coastal flood zone and tsunami evacuation zone, however, the replacement bridge would not alter or detrimentally affect the flooding characteristics in the area. The project site is not located adjacent to the shoreline or erosion-prone area, nor on geologically hazardous lands, or estuary, fresh water or coastal water.
- *Alters natural land forms (i.e. cut and fill, retaining walls) and existing public views to and along the shoreline.* The proposed project replaces an existing bridge on Kamehameha V Highway, and does not involve cut/fill or retaining walls. The existing residential development on the makai side of the highway obscures ocean views from the project site. There is no development on the mauka side of the highway, however, vegetation obscures views of the mountainside at the location of the bridge.
- *Is contrary to the objectives and policies of Chapter 205A, HRS.* The proposed project is not contrary to the objectives and policies of Chapter 205A HRS.

CHAPTER 4 - ALTERNATIVES CONSIDERED

4.1 No Action

The “no action” alternative would be to leave the bridge in its current condition, with no repair or rehabilitation work. This alternative is not acceptable as the bridge does not meet current HDOT/AASHTO and FHWA guidelines. If no repair or replacement work is performed on the bridge, the condition will continue to deteriorate age.

4.2 Rehabilitation

The bridge is over 70 years old and functionally obsolete. Rehabilitation of the existing bridge would involve strengthening, repairing and widening the existing structure. This extensive work would involve major reconstruction, which would still not address the current design guidelines. The bridge is supported by CRM abutments, which do not meet seismic standards. The geotechnical investigation found the lagoonal deposit layer underlying the site at depths ranging from 8 to 30.5 feet, which has potential for liquefaction during a seismic event. Soil remediation to prevent liquefaction during a seismic event is cost prohibitive. Drilled shafts were determined to be the best solution to mitigating the potential for liquefaction and thus requiring bridge replacement. Therefore, rehabilitation is not a viable alternative.

4.3 Alternate Design for Bridge Replacement

Replacement of the existing bridge would allow the new bridge to meet current State and Federal design guidelines. The preferred alternative uses drilled shafts to support the new precast plank deck of the bridge. Other design options include using a box culvert structure, Geosynthetic Reinforced Soil - Integrated Bridge System (GRS-IBS) structure, or other type of pile-supported bridge structure. Replacement with a culvert or bridge with GRS-IBS abutments would not be viable because of the substantial settlement due to liquefaction under the design seismic event. The preferred alternative, which is the proposed project, places the drilled shafts with cap beams outside of the existing abutments, and therefore outside of the existing stream. The precast concrete planks will span over the existing bridge opening, requiring no piles or other structure within the limits of the stream. Other alternate designs would involve removal of the existing abutments and construction within the limits of the stream, resulting in more significant environmental impacts.

CHAPTER 5 - FINDINGS AND DETERMINATION

The proposed replacement of Makakupaia Bridge was evaluated based on the thirteen (13) significance criteria of Hawaii Administrative Rules (HAR) Title 11, Chapter 200-12 of the Environmental Impact Statement Rules to determine whether the project will have a significant adverse impact to the environment. A “Finding of No Significant Impact” (FONSI) for this project is based on the following analysis.

5.1 *No irrevocable commitment to loss or destruction of any natural or cultural resource would result.* An Archaeological Assessment report revealed no archaeological or cultural sites within or near the project site. If previously unknown resources are uncovered during the course of construction, the Contractor will stop work immediately and notify the State Historic Preservation Division who will determine the appropriate treatment.

5.2 *The proposed project will not curtail the range of beneficial uses of the environment.* The proposed project will not affect the beneficial use of the existing highway and surrounding environment.

5.3 *The proposed project will not conflict with the State’s long-term environmental policies or goals and guidelines as expressed in Chapter 344, Hawaii Revised Statutes.* The State Environmental Policy encompasses two broad policies: conservation of natural resources, and enhancement of the quality of life. The proposed project would not conflict with the environmental policies, and quality of life would be maintained or enhanced through availability of reliable and safe transportation system.

5.4 *The proposed project would not substantially affect the economic or social welfare of the community or State.* The proposed project will provide a short-term economic benefit to the community during the construction phase. There are no adverse long-term economic or social welfare impacts associated with the proposed project. Maintenance of the highway contributes to the economic and social welfare of the community and of the state.

5.5 *The proposed project does not affect public health.* No adverse impacts to public health will result. The proposed project will facilitate provision of emergency and other public health services and will benefit public health by maintaining a reliable and safe highway.

5.6 *No substantial secondary impacts, such as population changes or effects on public facilities, are expected.* The proposed action will not alter the present location or capacity of the highway, and will not cause substantial secondary impacts.

5.7 *No substantial degradation of environmental quality is expected due to the proposed project.* The proposed project is not anticipated to negatively impact environmental quality.

Construction activities will have some effect due to short-term impacts from construction equipment noise, emissions, fugitive dust and traffic disruption. Construction-related impacts will be controlled and mitigated by utilizing BMPs and adhering to state and county rules regarding construction practices.

5.8 *No cumulative effect on the environment or commitment to larger actions will be involved.* The proposed project is not part of or linked to any larger action. The proposed project involves replacement of an existing bridge within the highway right-of-way.

5.9 *No rare, threatened or endangered species or their habitats are affected.* No impacts are anticipated on any candidate, proposed or listed endangered species or their habitats, and none are known to exist within the project limits. The replacement bridge will be constructed within the highway right-of-way. The temporary bypass road will be constructed on undeveloped land on the mauka side of the highway.

5.10 *The proposed project will not detrimentally affect air or water quality, or ambient noise levels.* Construction activities will have short-term impacts to air and noise quality from construction equipment noise, emissions and fugitive dust. Construction-related impacts will be controlled and mitigated by utilizing BMPs and adhering to state and county rules regarding construction practices. Upon completion of construction activities, air and ambient noise levels will revert to prior levels. BMPs will be utilized to prevent project site runoff from reaching coastal waters.

5.11 *The proposed project will not detrimentally affect environmentally sensitive areas such as flood plains, tsunami zones, beaches, erosion-prone areas, geologically hazardous lands, estuaries, fresh waters or coastal waters.* Kamehameha V Highway in the vicinity of the project site is located in a coastal flood zone and tsunami evacuation zone, however, the replacement bridge will not alter or detrimentally affect the flooding characteristics in the area. The project site is not located adjacent to a beach or erosion-prone area, nor on geologically hazardous lands, or estuary, fresh water or coastal water.

5.12 *The proposed project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.* There are no identified scenic vistas or viewplanes at the project site. The existing residential development on the makai side of the highway obscures ocean views from the project site. There is no development on the mauka side of the highway, however, vegetation obscures views of the mountainside at the location of the bridge.

5.13 *There will be no requirement for substantial energy consumption.* Construction and maintenance of the proposed project will not require substantial energy consumption.

CHAPTER 6 – AGENCIES AND PARTIES CONSULTED DURING THE PREPARATION OF THE ENVIRONMENTAL ASSESSMENT

The following agencies, organizations and individuals were consulted during the preparation of this document. Comment letters received (indicated by an asterisk) and written responses are included in Appendix D.

6.1 United States Government

- U.S. Army Corps of Engineers
- U.S. Department of Agriculture
- U.S. Fish and Wildlife Service*
- NOAA Inouye Regional Center, NMFS/PIRO

6.2 State of Hawaii

- Department of Business, Economic Development & Tourism
- Department of Agriculture
- Department of Hawaiian Home Lands
- Office of Planning
- Department of Health*
- Department of Land and Natural Resources*
- Office of Hawaiian Affairs

6.3 County of Maui

- Department of Fire and Public Safety
- Department of Parks and Recreation*
- Department of Planning
- Department of Public Works*
- Police Department
- Department of Transportation
- Department of Water Supply

6.4 Community, Private and Individuals

- Molokai Community College
- Maui Electric Company*
- Property Owner/Resident TMK:(2)5-4-003:028
- Property Owner/Resident TMK:(2)5-4-003:034
- Property Owner/Resident TMK:(2)5-4-003:035
- Property Owner/Resident TMK:(2)5-4-017:030
- Property Owner/Resident TMK:(2)5-4-017:029
- Property Owner/Resident TMK:(2)5-4-017:028
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- Property Owner/Resident TMK:(2)5-4-017:055
- Property Owner/Resident TMK:(2)5-4-017:045
- Property Owner/Resident TMK:(2)5-4-017:044

CHAPTER 7 - REFERENCES

Final Environmental Assessment for Proposed Kawela Bridge Replacement, Molokai, Hawaii, prepared for State of Hawaii Department of Transportation, prepared by Munekiyo & Hiraga, Inc., July 2009.

Flood Insurance Rate Map, Map Number 1500030194F, revised November 4, 2015, Federal Emergency Management Agency.

Maui County website.

Molokai Community Plan 2001, County of Maui.

Molokai Community Plan Update, prepared for Maui County Council, County of Maui Department of Planning, PD/CPAC/MoPC Draft May 2016.

Project Assessment Report, Kamehameha V Highway, Route 450, Replacement of Makakupaia Bridge, District of Molokai, Island of Molokai, prepared by State of Hawaii Department of Transportation, Highways Division, February 10, 2012.

Soil Resource Report for Island of Molokai, Hawaii, United States Department of Agriculture, Natural Resources Conservation Service.

State of Hawaii Land Use Commission website.

State of Hawaii Office of Planning GIS website.

EXHIBITS

1. Location Map
2. Photos of Bridge Approaches
3. Photos of Mauka and Makai Areas
4. Photos of Beach Fronting the Makakupaia Stream
5. Area of Potential Effect
6. Tax Map TMK:(2) 5-4-003
7. Tax Map TMK: (2) 5-4-017
8. Topographic Survey
9. Soil Designation Map
10. FEMA Flood Insurance Rate Map
11. State Land Use District Designation
12. Community Plan Land Use Designations
13. Special Management Area Map



View eastward.

Photo date:
11-13-2015



View westward.

Photo date:
11-13-2015

8-30-2012

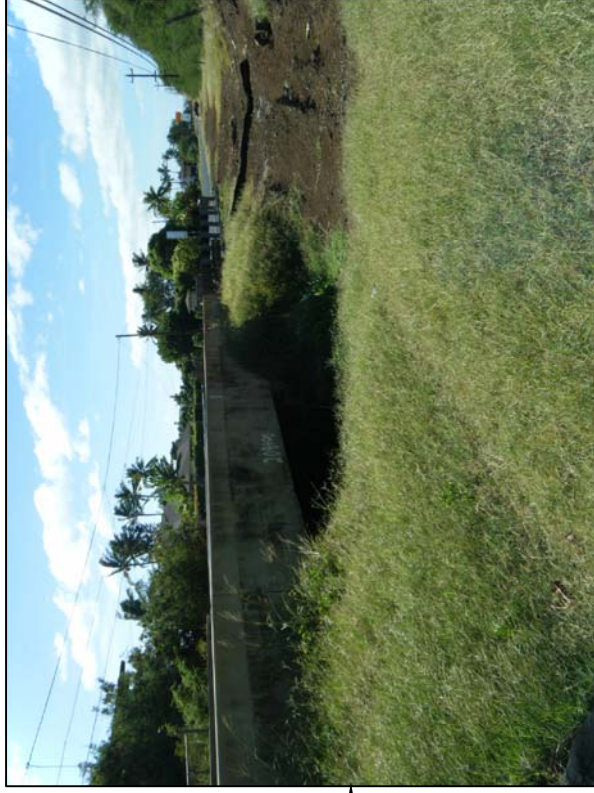




View westward on mauka (north) side of bridge.

Photo date:
8-30-2012

11-13-2015



View of makai (south) side of bridge.

Photo date:
8-30-2012

11-13-2015
Portion of ditch within highway right-of-way



EKNA SERVICES, INC.
Prepared for State of Hawaii
Department of Transportation

PHOTOS OF MAUKA AND MAKAI AREAS
ENVIRONMENTAL ASSESSMENT FOR: MAKAKUPAIA BRIDGE REPLACEMENT AT KAWELA, MOLOKAI

EXHIBIT

3



Photo date: 11-13-2015



End of fenceline and paved beach access on southeast side of the drainage ditch.

View towards ocean from end of ditch.

photo date: 11-13-2015



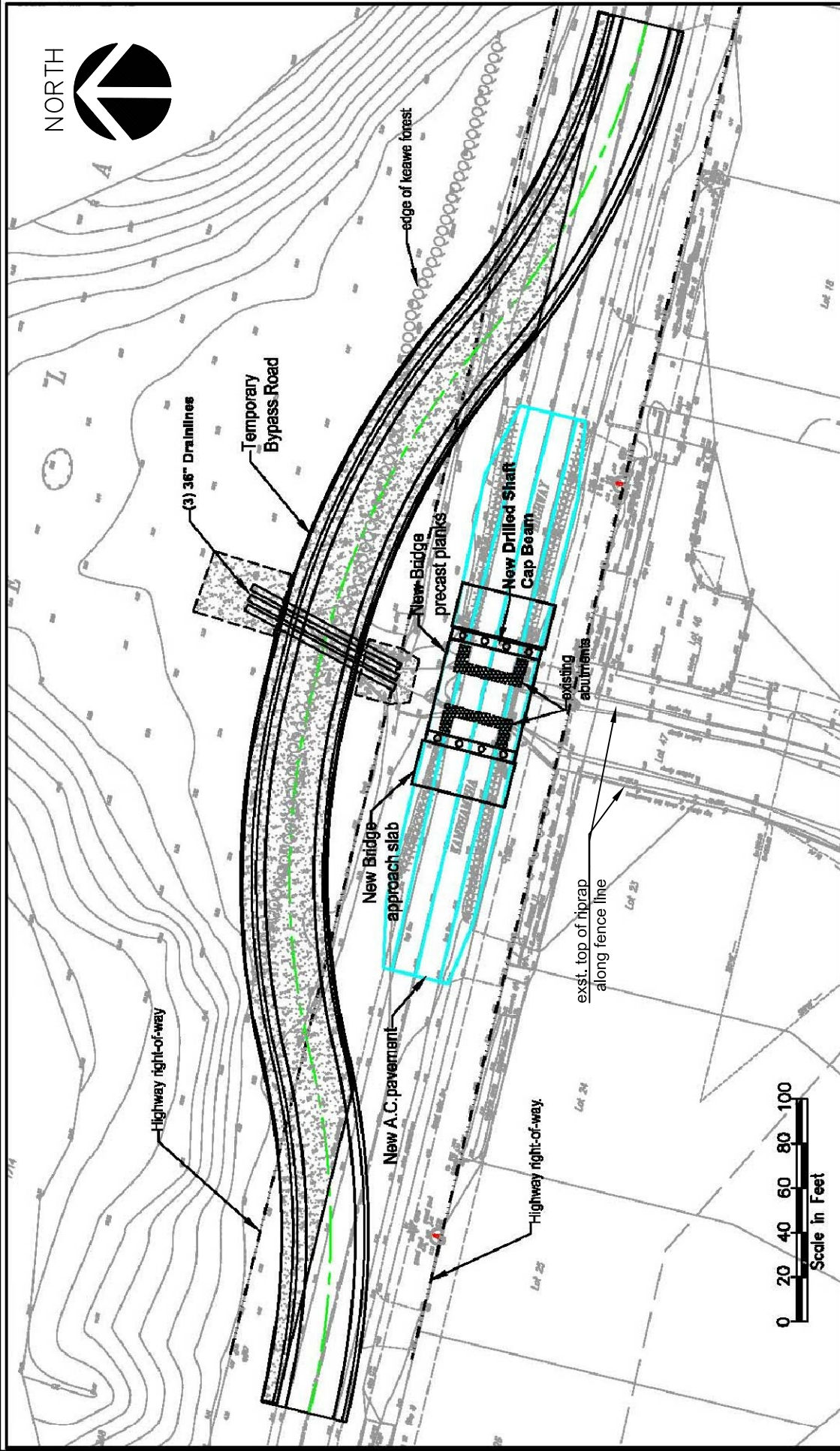
EKNA SERVICES, INC.
Prepared for State of Hawaii
Department of Transportation

PHOTOS OF BEACH FRONTING THE DRAINAGE DITCH

ENVIRONMENTAL ASSESSMENT FOR: MAKAKUPAIA BRIDGE REPLACEMENT AT KAWELA, MOLOKAI

EXHIBIT

4



Source: Mitsunaga & Assoc. and KSF, Inc.

EKNA 2717

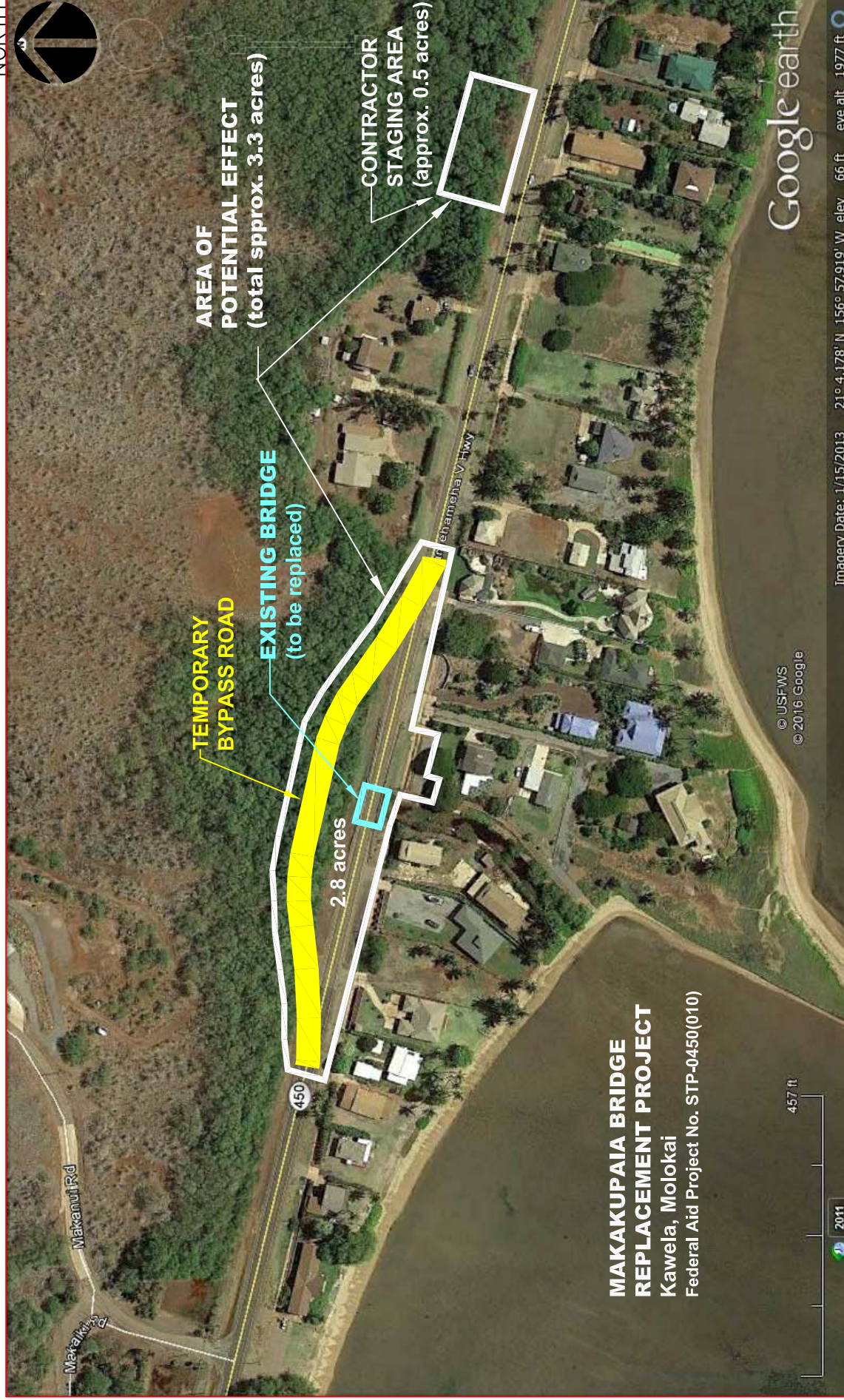


EKNA SERVICES, INC.
Prepared for State of Hawaii
Department of Transportation

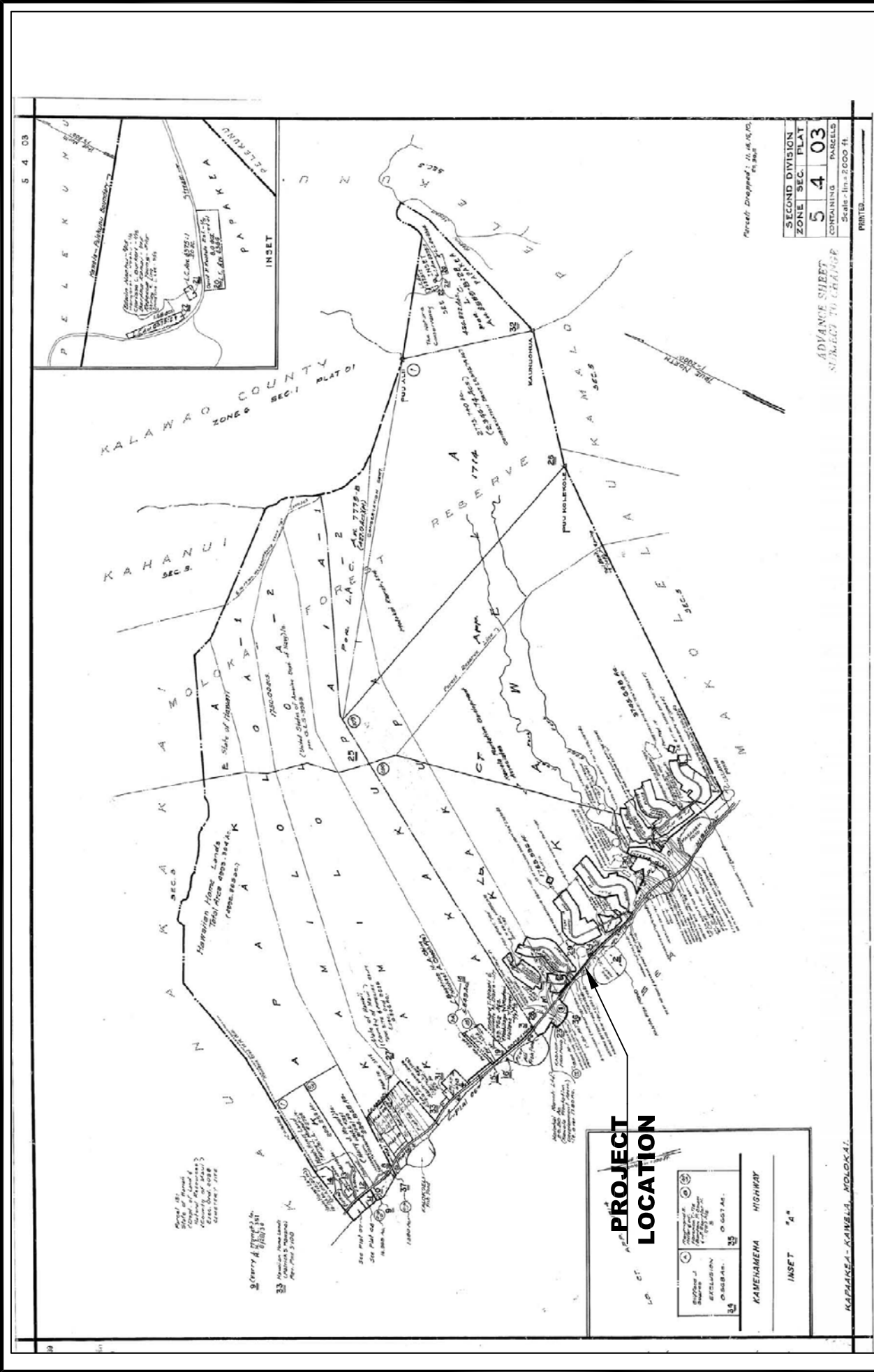
CONCEPT PLAN FOR BRIDGE REPLACEMENT AND TEMPORARY BYPASS

ENVIRONMENTAL ASSESSMENT FOR: MAKAKUPAIA BRIDGE REPLACEMENT AT KAWELA, MOLOKAI

NORTH



EKNA 2717



5	4	4	17	2ND	DIST.
5	4	4	17	2ND	DIST.



NOTE: All lots owned by
Cecilia R. Karmakova
unless otherwise noted.

**FOR PROPERTY ASSESSMENT PURPOSES
SUBJECT TO CHANGE**

DEPARTMENT OF TAXATION
PROPERTY TECHNICAL OFFICE
TAX MAPS BRANCH
STATE OF HAWAII

TAX MAP

SECOND TAXATION DISTRICT	
ZONE	PLAT
5	4 17

SCALE: 1 IN. = 100 FT.

EXHIBIT 6

EKNA SERVICES, INC.
Prepared for State of Hawaii
Department of Transportation



EKNA 2717

Source: U.S. Department of Agriculture, Natural Resources Conservation Service



EKNA SERVICES, INC.
Prepared for State of Hawaii
Department of Transportation

SOIL DESIGNATION MAP

ENVIRONMENTAL ASSESSMENT FOR: MAKAKUPAIA BRIDGE REPLACEMENT AT KAWELA, MOLOKAI

EXHIBIT

11





EXHIBIT

13

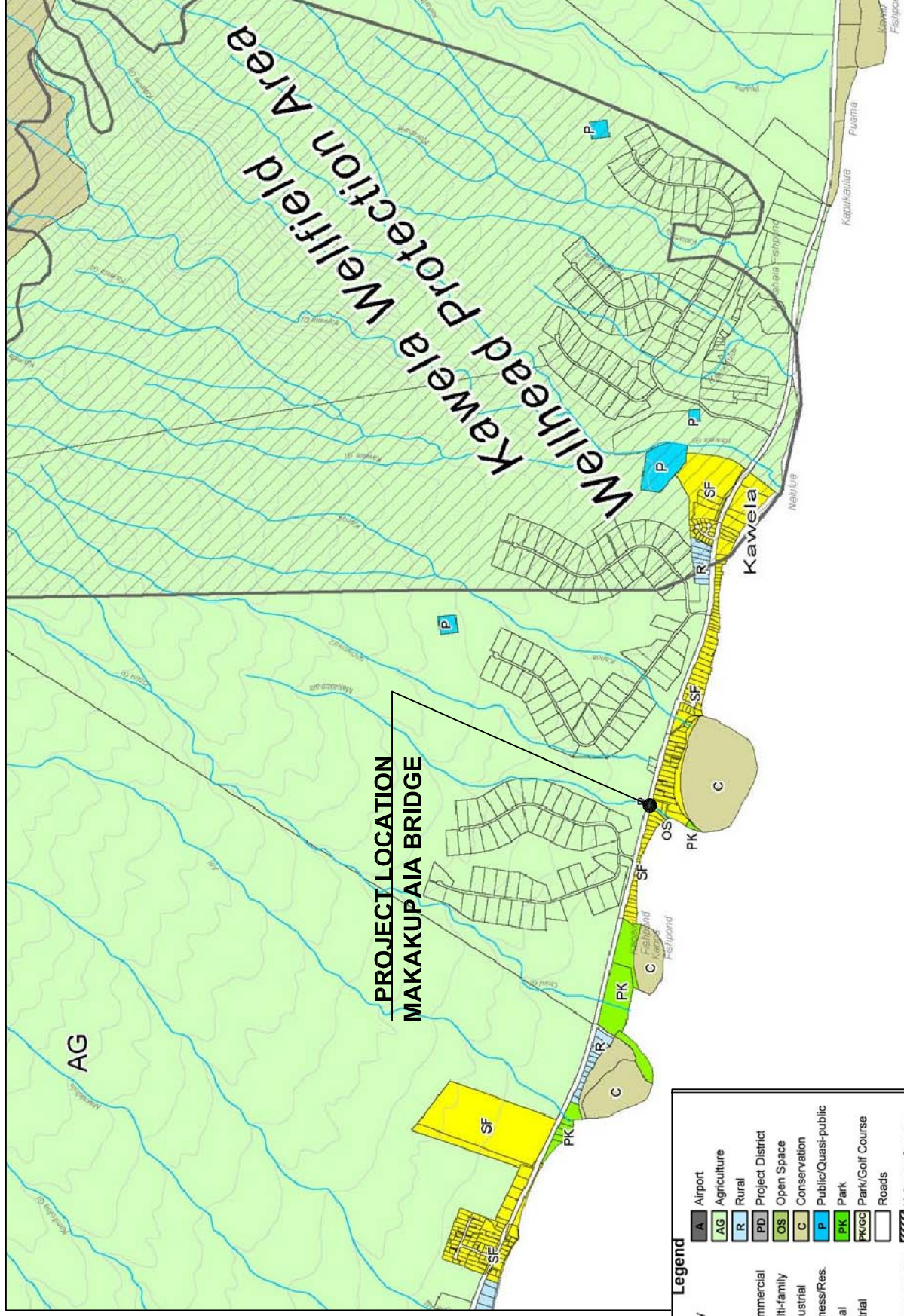
AERIAL PHOTO WITH PLAN OVERLAY

ENVIRONMENTAL ASSESSMENT FOR: MAKAKUPAIA BRIDGE REPLACEMENT AT KAWELA, MOLOKAI



EKNA SERVICES, INC.
Prepared for State of Hawaii
Department of Transportation

NORTH



Source: Maui County website, Central Molokai Community Plan, approved 3-7-07.

EKNA 2717



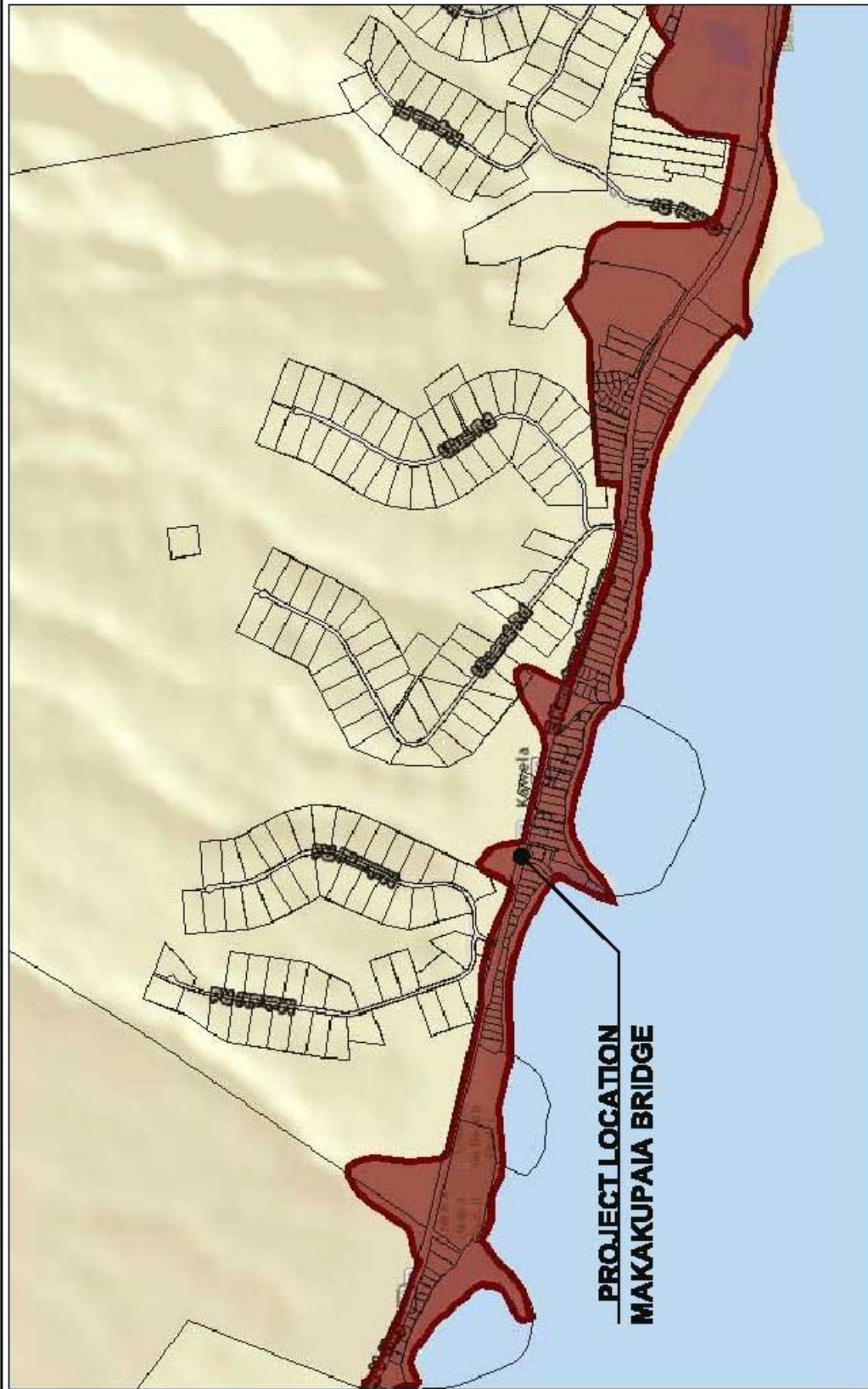
EKNA SERVICES, INC.
Prepared for State of Hawaii
Department of Transportation

COMMUNITY PLAN LAND USE DESIGNATIONS

ENVIRONMENTAL ASSESSMENT FOR: MAKAKUPAIA BRIDGE REPLACEMENT AT KAWELA, MOLOKAI

EXHIBIT

15



July 22, 2016

TMK - Neighbor Islands

Special Management Area (SMA)

1:18,056

0 0.15 0.3 0.5 0.8 mi

0 0.25 0.5 1 km

Sources: BTL, HERE, DeLorme, USGS, Intermap, INCREMENT P, Corp.,
NRCAN, Esri/Japan, METI, Esri/China (Hong Kong, Esri (Hawaii),

Sources: State of Hawaii Office of Planning GIS website, SMA Locator Map

EKNA 2717



EKNA SERVICES, INC.
Prepared for State of Hawaii
Department of Transportation

SPECIAL MANAGEMENT AREA MAP (SMA)
ENVIRONMENTAL ASSESSMENT FOR: MAKAKUPAIA BRIDGE REPLACEMENT AT KAWELA MOLOKAI

EXHIBIT
16

APPENDICES

Appendix A - Environmental Surveys of Makakupaia Stream and Vicinity for the Makakupaia Bridge Replacement Project Near Kawela, Molokai

Appendix B - Archaeological Assessment for Makakupaia Bridge Replacement Project, Kawela Ahupuaa, Kona District, Island of Molokai

Appendix C - NHPA Section 106 Documentation

Appendix D - Coordination, Comment and Response Letters

APPENDIX A

Environmental Surveys of Makakupaia Stream and Vicinity for the Makakupaia Bridge Replacement Project Near Kawela, Molokai

Environmental surveys of Makakupa‘ia Stream and vicinity for the Makakupaia Bridge Replacement Project near Kawela, Moloka‘i



Prepared by:

AECOS, Inc.
45-939 Kamehameha Hwy, Suite 104
Kāne‘ohe, Hawai‘i 96744-3221

June 16, 2017
REVISED June 10, 2019

Environmental surveys of Makakupa‘ia Stream and vicinity for the Makakupaia Bridge Replacement Project near Kawela, Moloka‘i

June 16, 2017
Revised June 10, 2019

AECOS No. 1457

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Introduction

The State of Hawai‘i, Department of Transportation, Highways Division proposes to replace the Kamehameha V Highway bridge crossing Makakupa‘ia Stream (herein the “Project”), situated along the southern coast of Moloka‘i (Figure 1). AECOS, Inc. was contracted to conduct environmental surveys to support permitting for the Project¹. Our surveys were undertaken on April 8, 2016 and included considering Clean Water Act (CWA) jurisdiction, surveying aquatic fauna in the stream, and assessing terrestrial flora and fauna at the Project site. This report details findings of those surveys.

Stream Description

Makakupa‘ia Stream is shown on United State Geological Service (USGS) 7.5’ series topographic maps as a “blue line” stream that originates near the 300-ft elevation and extends south-southwest for 1.5 mi (2.4 km) before reaching the Pacific Ocean just west of Kanoa Fishpond (Figure 2). The intermittent stream has a discernible channel with bed and banks approximately 330 ft (100 m) upstream from Kamehameha V Highway (and, presumably, also at higher elevations) outside of the Project area. In a *kiawe* forest located between the highway and the discernible stream channel, evidence of stream flow is generally absent: neither a channel nor evidence of an ordinary high water

¹ Report prepared for EKNA Services, Inc. for environmental entitlements. This report will become part of the public record for the Project.

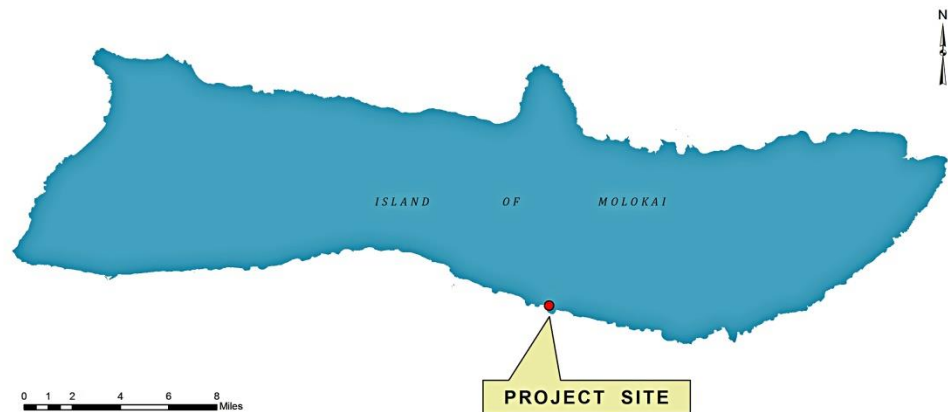


Figure 1. General location of Project on southern coast of Moloka'i.

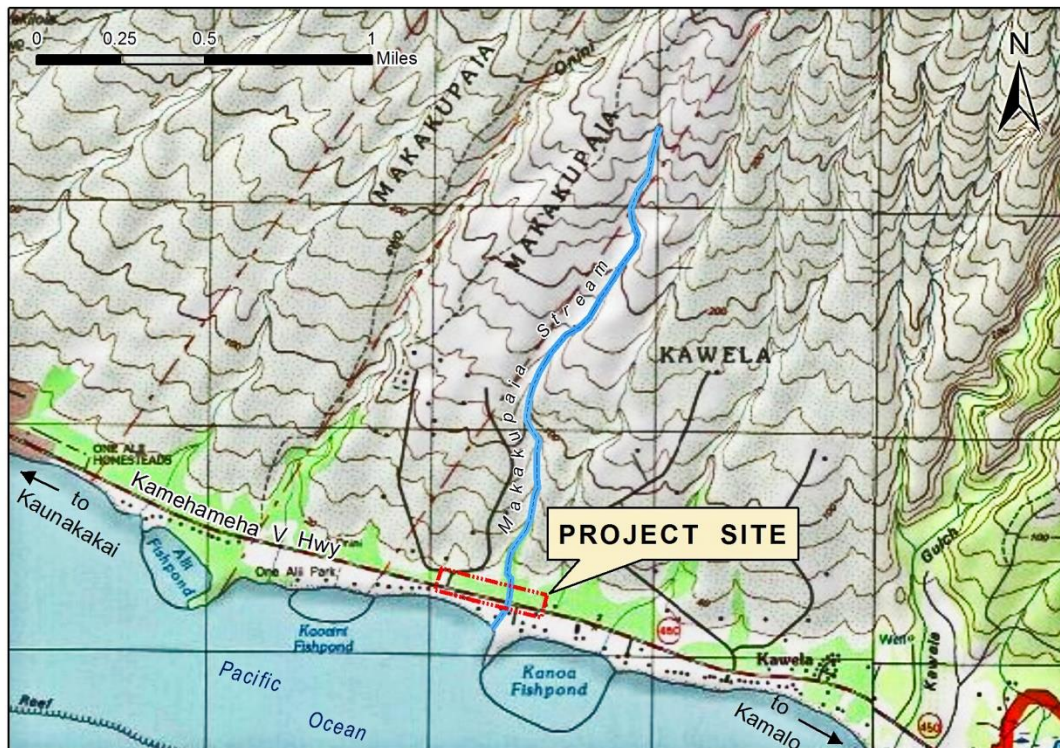


Figure 2. Makakupa'ia Stream and Project location near Kawela, Molokai.

mark are apparent. At the southern edge of the *kiawe* forest, near the highway a small, perhaps excavated, channel directs water to the existing bridge.

Downstream from the highway, the bed is partially overgrown with vegetation and confined between concrete-rock-masonry (CRM) walls. The presence of fish and wetland vegetation in this *muliwai* (brackish water pond behind a beach) indicate water is likely to be present here year-round. Makakupa'ia Stream outlet, seaward of the lined channel, is usually blocked by a deposit of sand. *Kiawe* (*Prosopis pallida*) trees and *naupaka kahakai* (*Scaevola taccada*) shrubs are well established on the beach indicating the channel rarely, if ever has surface flow reaching the ocean.

Makakupa'ia Stream does not appear in the Hawaii Stream Assessment (Hawaii Cooperative Park Service Unit, 1990), the Hawaii Watershed Atlas (Parham et al, 2009), or the listing of impaired waterbodies found in the 2014 State of Hawai'i water quality monitoring and assessment report (HDOH, 2014).

Methods

Botanical Survey

A survey of plants growing in the Project area was undertaken by traversing on foot the *muliwai*, *kiawe* forest, highway right-of-way, and a separate potential staging area included in the Project (Figure 3). Plants were identified in the field and those not immediately identifiable were photographed and/or a part "collected" for identification in the laboratory. Additionally, once the revised staging area was designated in the *kiawe* forest east of the initial survey area, aerial photography and street view photographs (via Google Earth Pro) were reviewed to confirm the species composition of this segment of forest is consistent with that surveyed on April 8, 2016.

Plant names follow *Manual of the Flowering Plants of Hawai'i* (Wagner, Herbst, & Sohmer, 1999) for native and naturalized flowering plants and *A Tropical Garden Flora* (Staples & Herbst, 2005) for crop and ornamental plants. Some plant names have been updated as presented in various recent published papers summarized by Imada (2012).

Aquatic Biota

Biologists made visual observations of aquatic organisms by walking along the stream channel in the Project area. Less than ideal conditions were encountered with slightly turbid brown or green water present in the *muliwai* south of the highway. No water was present in the channel upstream of the Kamehameha V Highway right-of-way.

Dip nets were utilized to confirm the identification of species observed and to reach into deeper water of the *muliwai*. As the survey progressed, notes were made on relative abundance (e.g., rare, common, abundant) of each species encountered. Nomenclature and identifications follow *Hawai'i's Native and Exotic Freshwater Animals* (Yamamoto and Tagawa, 2000).

Avian Survey

A bird survey included four stationary visual counts in which all birds observed during an 8-minute period were recorded. Visual count stations were located at the east and west end of the bridge work area, in the *kiawe* forest *mauka* of the highway, and in the proposed staging area (see Fig. 3). Additional species not observed during stationary visual counts, but observed during water quality or botanical surveys, were noted as incidental sightings; these individuals were not counted.

Additionally, a single 30-minute waterbird count was conducted at the bridge crossing (Sta. WB; see Fig. 3) on the morning of April 8, 2016. Species identifications were verified with *A Photographic Guide to the Birds of Hawaii: the Main Islands and Offshore Waters* (Denny, 2010). Taxonomy follows the Checklist of North and Middle American Birds by American Ornithologists' Union (AOU, 2016).

Terrestrial Mammal Survey

A list of mammal species observed in the Project area was made as biologists conducted the botanical, aquatic biota, and avian surveys. Visual observation for tracks, scat or other signs of mammalian usage of the Project area was undertaken concurrently with our other surveys. Mammalian nomenclature follows *Mammals in Hawai'i* (Tomich, 1986).



Figure 3. Botanical survey areas and avian count stations surveyed on April 8, 2016.

Jurisdictional Considerations

Although our scope of work did not include a wetland delineation, biologists evaluated wetland characteristics at five stations to supplement our observations and to evaluate CWA jurisdictional limits within the Project area (wetland data determination sheets are provided in Attachment 1). Hydrology, soil type and surrounding vegetation were assessed (USACE, 1987, 2012) at each station to evaluate the presence of wetland characteristics.

The National Wetland Inventory (NWI; USFWS, 1984) shows an extensive mangrove wetland (seasonally flooded, broad-leaved evergreen forested palustrine wetland or PFO3C) surrounding Kanoa Fishpond (Figure 4). However, this area consists largely of developed lots and therefore did not require further investigation to confirm as upland (non-wetland). The verge on the *mauka* side of Kamehameha V Highway and the potential staging area exhibited some wetland characteristics (e.g., surface salt deposits, aquatic or facultative vegetation), so we conducted a wetlands investigation of both of these areas. Additionally, we investigated the extent of the *muliwai* and identified areas of the stream channel that have bed and banks and show an ordinary high water mark (OHWM). We did not delineate the OHWM.



Figure 4. NWI map and wetland data stations surveyed on April 8, 2016.

Survey Results

Flora

Within the Project area, Makakupa'ia Stream is a channelized brackish-water *muliwai* with both aquatic and facultative vegetation². *Kaluhā* (*Bolboschoenus maritimus*) and *makaloa* (*Cyperus laevigatus*) grow in the wettest parts of the channel. Bermuda grass (*Cynodon dactylon*) and seashore paspalum (*Paspalum vaginatum*) grow over a concrete weir structures in the stream bed *makai* of the highway. Indian fleabane (*Pluchea indica*), *koa haole* (*Leucaena leucocephala*), and *niu* or coconut palm (*Cocos nucifera*) saplings occur sparsely along the margins of the *muliwai*. Buffelgrass (*Cenchrus ciliaris*), *naupaka kahakai*, and Guinea grass (*Megathyrsus maximus*) grow along the banks of the *muliwai*.

The highway right-of-way in the Project area is dominated by Bermuda grass and ruderal herbs (Figure 5). Creeping indigo (*Indigofera hendecaphylla*), *kīpukai* (*Heliotropium curassavicum*), pigweed (*Portulaca oleracea*), garden spurge (*Euphorbia hirta*), and swollen fingergrass (*Chloris barbata*) are encountered regularly. Indigenous *ūhaloa* (*Waltheria indica*) grows near the bridge. *Mauka* of the highway right-of-way is a forest composed exclusively of *kiawe* trees.



Figure 5. Kamehameha V highway right-of way-at the Project site.

² Facultative plants occur in wetlands and non-wetlands (Lichvar and Gillrich, 2011).

The potential staging area at Kamehameha Highway and Makanui Road intersection appears to be two retention basins constructed for upslope developments. *Kīpukai*, *'akulikuli* (*Sesuvium portulacastrum*), and a sedge (*Cyperus difformis*) cover the ground in both basins (Figure 6).

Spikerush (*Eleocharis radicans*) is the only species present in the western staging area and not in the eastern staging area (Makanui Road dividing the two areas). The sides of both staging areas are planted with weeping bottle brush (*Callistemon viminalis*), coconut palm, and false kamani (*Terminalia catappa*). A few Chinese fan palms (*Livistona chinensis*) are also planted alongside the staging areas close to Makanui Road. A listing of all vascular plants observed in the survey area is presented as Table 1.

Aerial and street view photography of the *kiawe* forest at the revised staging area, east of the original survey area reveal the same plant species and abundances as the segment of *kiawe* forest surveyed on April 8, 2016.



Figure 6. Saturated soil and standing water in one of the retention basins within the potential staging area at Makanui Rd.

Table 1. Checklist of plants found in the Project area.

Family <i>Species</i>	Common name	Statu S	Abundance		
			<i>Muliwai</i>	Hwy R-o-W	Staging Area
FLOWERING PLANTS					
DICOTYLEDONES					
AIZOACEAE					
<i>Sesuvium portulacastrum</i> (L.) L.	‘akulikuli, sea purslane	Ind	O	O	C
APOCYNACEAE					
<i>Nerium oleander</i> L.	oleander	Orn	--	R	--
AMARANTHACEAE					
<i>Alternanthera pungens</i> Kunth	khaki weed	Nat	--	U	--
ARALIACEAE					
<i>Schefflera actinophylla</i> (Endl.) Harms	octopus tree	Nat	--	R	--
ASTERACEAE (COMPOSITAE)					
<i>Pluchea indica</i> (L.) Less.	Indian fleabane	Nat	O	O	--
<i>Xanthium strumarium</i> L. var. <i>canadense</i> (Mill.) Torr. & A.Gray	kīkānia, cocklebur	Nat	R	--	--
BATAACEAE					
<i>Batis maritima</i> L.	pickleweed	Nat	O	--	--
BORAGINACEAE					
<i>Cordia subcordata</i> Lam.	<i>kou</i>	Ind	R	--	--
<i>Heliotropium curassavicum</i> L.	<i>kīpūkai</i> seaside heliotrope	Ind	O	O	O
CHENOPODIACEAE					
<i>Atriplex semibaccata</i> R.Br	Australian saltbush	Nat	--	R	--
<i>Atriplex suberecta</i> Verd.	---	Nat	--	U	--
<i>Chenopodium murale</i> L.	lamb’s quarters	Nat	--	R	--
COMBRETACEAE					
<i>Terminalia catappa</i> L.	tropical almond	Nat	--	--	R
CONVOLVULACEAE					
<i>Merremia tuberosa</i> (L.) Rendle	woodrose	Nat	--	R	--
EUPHORBIACEAE					
<i>Euphorbia hirta</i> L.	garden spurge	Nat	--	O	--
<i>Phyllanthus debilis</i> Klein ex Willd	niruri	Nat	--	R	--
FABACEAE					
<i>Albizia saman</i> F. Muell.	monkeypod	Nat	R	--	--
<i>Cassia</i> sp.	indet. shower tree	Orn	R	--	--

Table 1 (continued).

Family <i>Species</i>	Common name	Statu S	Abundance		
			<i>Muliwai</i>	Hwy R-o-W	Staging Area
<i>Desmanthus pernambucanus</i> (L.) Thell.	virgate mimosa	Nat	--	U	--
<i>Indigofera hendecaphyla</i> Jacq.	creeping indigo	Nat	--	O	--
<i>Leucaena leucocephala</i> (Lam.) deWit	<i>koa haole</i>	Nat	--	U	--
<i>Indigofera hendecaphyla</i> Jacq.	creeping indigo	Nat	--	O	--
<i>Macroptilium lathyroides</i> (L.) Urb.	wild bean, cow pea	Nat	R	--	--
<i>Prosopis pallida</i> (Humb. & Bonpl. ex Willd.) Kunth	<i>kiawe</i>	Nat	R	AA	--
<i>Vachellia farnesiana</i> (L.) Wight & Arnott	<i>kolū, klu</i>	Nat	--	R	--
GOODENIACEAE					
<i>Scaevola taccada</i> (Gaertn.) Roxb.	<i>naupaka kahakai</i>	Ind	R	--	--
LAMIACEAE					
<i>Leonotis nepetifolia</i> (L.) R. Br.	lion's ear	Nat	--	R	--
MALVACEAE					
<i>Waltheria indica</i> L.	<i>'uhaloa</i>	Nat	U	O	--
MYRTACEAE					
<i>Callistemon viminalis</i> (Sol. ex Gaertn.) Cheel	weeping bottle brush	Orn	--	--	R
NYCTAGINACEAE					
<i>Boerhavia coccinea</i> Mill.	false alena	Nat	R	O	--
PORTULACACEAE					
<i>Portulaca oleracea</i> L.	pigweed	Nat	--	O	--
RHIZOPHORACEAE					
<i>Rhizophora mangle</i> L.	American or red mangrove	Nat	R	--	--
MONOCOTYLEDONES					
ARECACEAE					
<i>Cocos nucifera</i> L.	<i>niu</i> ; coconut palm	Pol	R	R	U
<i>Livistona chinensis</i> (Jacq.) R.Br. ex Mart.	Chinese fan palm	Nat	--	--	R
CYPERACEAE					
<i>Bolboschoenus maritimus</i> (L.) Palla ssp. Paludosus (A.Nelson) T.Koyama	<i>kaluhā</i> saltmarsh bulrush	Ind	C	--	--
<i>Cyperus laevigatus</i> L.	<i>makaloa</i> ; smooth flatsedge	Ind	O	--	--

Table 1 (continued)

Family <i>Species</i>	Common name	Status	Abundance		
			Muliwai	Hwy R-o-W	Staging Area
<i>Cyperus difformis</i> L.	smallflower umbrella sedge	Nat	--	--	O
<i>Eleocharis radicans</i> (Poir.) Kunth	spike rush	Nat	--	--	O
POACEAE					
<i>Bothriochloa pertusa</i> (L.) Camus	pitted beardgrass	Nat	--	R	R
<i>Cenchrus ciliaris</i> L.	buffelgrass	Nat	U	U	--
<i>Chloris barbata</i> (L.) Sw.	swollen fingergrass	Nat	--	O	--
<i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	Nat	A	AA	A
<i>Diplachne fusca</i> subsp. <i>uni-</i> <i>nervia</i> (J.Presl) P.M.Peterson & N.Snow	sprangletop	Nat	O	--	--
<i>Megathyrsus maximus</i> (Jacq.) B.K. Simon & W.L. Jacobs	Guinea grass	Nat	O	O	--
<i>Paspalum vaginatum</i> Sw.	seashore paspalum	Nat	U	--	--
<i>Stenotaphrum secundatum</i> (Walter) Kuntze	St. Augustine grass	Nat	--	R	--

Table 1 (continued).

Key to Table 1

STATUS = distributional status for the Hawaiian Islands:

- Ind** - indigenous; native to Hawaii, but not unique to the Hawaiian Islands
Nat - naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation
Orn - exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation)
Pol - Polynesian introduction before 1778

ABUNDANCE = occurrence ratings for plants by area:

- R** - Rare - seen in only one or perhaps two locations
U - Uncommon - seen at most in several locations
O - Occasional - seen with some regularity
C - Common - observed numerous times during the survey
A - Abundant - found in large numbers; may be locally dominant
AA - Very abundant - abundant and dominant; a defining vegetation type

Aquatic Biota

In the vicinity of the Project, Makakupa'ia Stream has limited aquatic resources. A listing of species observed is provided as Table 2. Water quality appears to be

poor and only a few species were observed in the waterway. Rambur's forktail (*Ischnura ramburii*) and fragile forktail (*Ischnura posita*) skim the *muliwai* waters, frequently resting on bulrush or grasses along the channel margins. Green darners (*Anax junius*), roseate skimmers (*Orthemis ferringunea*), and wandering gliders (*Pantala flavescens*) fly above the water searching for prey.

Table 2. List of aquatic species observed in Makakupa'ia *muliwai*.

PHYLUM, CLASS, ORDER, FAMILY <i>Genus species</i>	Common name	Abundance	Status
INVERTEBRATES			
ARTHROPODA, INSECTA			
ODONATA			
unid.	indet. nymphs	C	--
AESHNIDAE			
<i>Anax junius</i> Drury	common green darner	O	Ind
LIBELLULIDAE			
<i>Orthemis ferruginea</i> Fabricius	roseate skimmer	R	Nat
<i>Pantala flavescens</i> Fabricius	wandering glider	R	Nat
COENAGRIONIDAE			
<i>Ischnura posita</i> Hagen	fragile forktail	R	Nat
<i>Ischnura ramburii</i> Selys	Rambur's forktail	C	Nat
FISHES			
CHORDATA, ACTINOPTERYGII			
POECILIIDAE			
<i>Poecilia</i> hybrid complex	molly hybrid	C	Nat
AMPHIBIANS			
AMPHIBIA, ANURA			
BUFONIDAE			
<i>Rhinella marina</i> Linnaeus	cane toad tadpoles	C	Nat

Key to Table 2

Abundance categories:

R – Rare – only one or two individuals observed.

O – Occasional – seen irregularly in small numbers

C – Common – observed everywhere, although generally not in large numbers.

Status categories:

Ind – Indigenous – species found in Hawai'i and elsewhere.

Nat – Naturalized – species introduced to Hawai'i intentionally, or accidentally.

A conspicuous topminnow (*Poecilia* sp. hybrids) is present throughout the channel near the water surface. Numerous dragonfly or damselfly nymphs (Order Odonata) and cane toad (*Rhinella marina*) tadpoles were observed in the deeper parts of the *muliwai*.

Avian Survey

During the eight minute, stationary visual counts at four stations, 84 individual birds of 17 different species representing 12 families were observed. Nearly half (43%) of the birds were accounted for by three species: Common Myna (*Acridotheres tristis*), House Finch (*Haemorhous mexicanus*), and Japanese White-eye (*Zosterops japonicus*). Spotted Dove (*Streptopelia chinensis*) and Red Junglefowl (*Gallus gallus*) were also observed consistently, the cacophonous calls of the latter heard throughout the survey.

Two waterbird species were identified during the 30-minute waterbird survey in Makakuupa'ia *muliwai*. A pair of *ae'o* (*Himantopus mexicanus knudseni*) flew over the *makai* end of the waterway and two mallard ducks (*Anas platyrhynchos*) were observed near the sand berm blocking the stream mouth.

Two indigenous species were observed near the Project area between stationary visual counts. The Black-crowned Night Heron (*Nycticorax nycticorax*) was sighted downstream from the Project site, stalking prey along the edge of the *muliwai*. A single *kōlea* (*Pluvialis fulva*) was observed loafing along the margin of the proposed staging area. Table 3 list birds observed during stationary visual counts.

Terrestrial Mammals

No mammals were observed during the April 8, 2016 survey. Tracks and scat from axis deer (*Axis axis*) and feral pig (*Sus scrofa*) were observed in the Project area. Game trails are ubiquitous in the *kiawe* forest (Figure 6) with deer scat encountered on every trail. Several deer skeletons are also present in the forest, likely left behind by hunters.

It is possible that feral Domestic dog (*Canis familiaris*), feral House cat (*Felis catus*), Small Indian mongoose (*Herpestes auropunctatus*), or one or more of the four naturalized rodents (Family Muridae) in the Hawaiian Islands utilize the Project area, though no tracks, scat or other evidence was sighted.

Table 3. List of birds observed during surveys of the Project area on April 8, 2016.

PHYLUM, CLASS, ORDER, FAMILY	<i>Genus species</i>	Common name	Status	Visual surveys				Relative Abundance
				Sta.1	Sta.2	Sta. 3	Sta. 4	
CHORDATA, AVES								
ANSERIFORMES								
ANATIDAE								
	<i>Anas platyrhynchos</i> Linnaeus	Mallard Duck	Nat	--	--	--	--	2.00-WB
CHARADRIIFORMES								
CHARADRIIDAE								
	<i>Pluvialis fulva</i> Gmelin	<i>kōlea</i> Pacific Golden- Plover	Ind M	--	--	--	--	incd
RECURVIROSTRIDAE								
	<i>Himantopus</i> <i>mexicanus knudseni</i> Stejneger	<i>ae'o;</i> Hawaiian Stilt	Ind R	--	--	--	--	2.00-WB
COLOMBIFORMES								
COLUMBIDAE								
	<i>Columba livia</i> Gmelin	Rock Dove	Nat	1	--	--	2	0.75
	<i>Geopelia striata</i> Linnaeus	Zebra Dove	Nat	--	3	--	5	2.00
	<i>Streptopelia chinensis</i> Scopoli	Spotted Dove	Nat	--	2	--	6	2.00
GALLIFORMES								
PHASIANIDAE								
	<i>Fringilla</i> <i>pondicerianus</i> Gmelin	Gray Francolin	Nat	--	4	--	--	1.00
	<i>Gallus gallus</i> Linnaeus	Red Junglefowl	Nat	4	--	--	4	2.00
PASSERIFORMES								
FRINGILIDAE								
	<i>Haemorrhous</i> <i>mexicanus</i> Müller	House Finch	Nat	4	--	2	3	2.25
ICTERIDAE								
	<i>Sturnella neglecta</i> Audubon	Western Meadowlark	Nat	--	2	--	--	0.50
MIMIDAE								
	<i>Mimus polyglottos</i> Linnaeus	Northern Mockingbird	Nat	--	1	--	--	0.25
MUSCICAPIDAE								
	<i>Copsychus</i> <i>malabaricus</i> Scopoli	White-rumped Shama	Nat	--	1	--	1	0.50

Table 3 (continued)

PHYLUM, CLASS, ORDER, FAMILY		Visual surveys					Relative Abundance
<i>Genus species</i>	Common name	Status	Sta.1	Sta.2	Sta. 3	Sta. 4	
PASSERIDAE							
<i>Passer domesticus</i> Linnaeus	House Sparrow	Nat	4	--	2	--	1.50
STURNIDAE							
<i>Acridotheres tristis</i> Linnaeus	Common Myna	Nat	4	--	--	12	4.00
THRAUPIDAE							
<i>Cardinalis cardinalis</i> Linnaeus	Northern Cardinal	Nat	--	3	--	--	0.75
<i>Paroaria coronata</i> J.F. Miller	Red-crested Cardinal	Nat	2	--	--	--	0.50
ZOSTEROPIDAE							
<i>Zosterops japonicus</i> Temminck & Schlegel	Japanese White- eye	Nat	2	--	2	7	2.75
PELECANIFORMES							
ARDEIDAE							
<i>Bubulcus ibis</i> Linnaeus	Cattle Egret 'auku'u	Nat	--	--	--	1	0.25
<i>Nycticorax nycticorax</i> Linnaeus	Black-crowned Night-Heron	Ind R	--	--	--	--	incd

Key to Table 3

Status codes:

Ind M – indigenous migrant**Ind R** – indigenous resident

Nat – naturalized to the Hawaiian Islands intentionally or accidentally

Incd – encountered during botanical or aquatic biology survey

WB – encountered during waterbird survey

Jurisdictional Waters

Makakupa'ia Stream appears to be jurisdictional under the Clean Water Act (CWA). The channelized *muliwai* contains wetlands and standing water at the time of our site visit. Our survey coincided mostly with a rising tide, beginning just before a -0.18 ft lower low tide (relative to mean lower low water [MLLW; Kahului Station, ID: 1615680; NOAA, 2016]). Although surface flow to the Pacific Ocean is blocked by a vegetated sand beach, the waterbody is considered to be adjacent to the ocean (USACE, 1986) and, therefore, jurisdictional. We determined the inland limit of the *muliwai* to be as shown in Figure 7, between SP-4 and SP-5.



Figure 6. Axis deer trail (center, bottom) through the *kiawe* forest *mauka* of Kamehameha V Hwy.

A channel directs flow from the *kiawe* forest under Kamehameha V Highway Bridge. This channel appears to have been recently excavated (Figure 8) and has neither a bed and banks, nor an ordinary high water mark (OHWM). However, 100 m (330 ft) upstream of the highway, well outside of the Project area, Makakupa'ia Gulch contains a bed and banks and OHWM. Due to the proximity of the gulch to the jurisdictional *muliwai* and Pacific Ocean, the conservative approach is to consider the entire stream channel within the Project Area to be jurisdictional.

We completed three wetland data determination forms in the potential staging area and determined the two basins are wetlands. Wetland boundaries of the basins are shown in Figure 9). Due to their proximity to the shore (approximately 60 m or 200 ft), these wetlands are likely to be considered to be adjacent wetlands and, therefore, jurisdictional under the CWA.

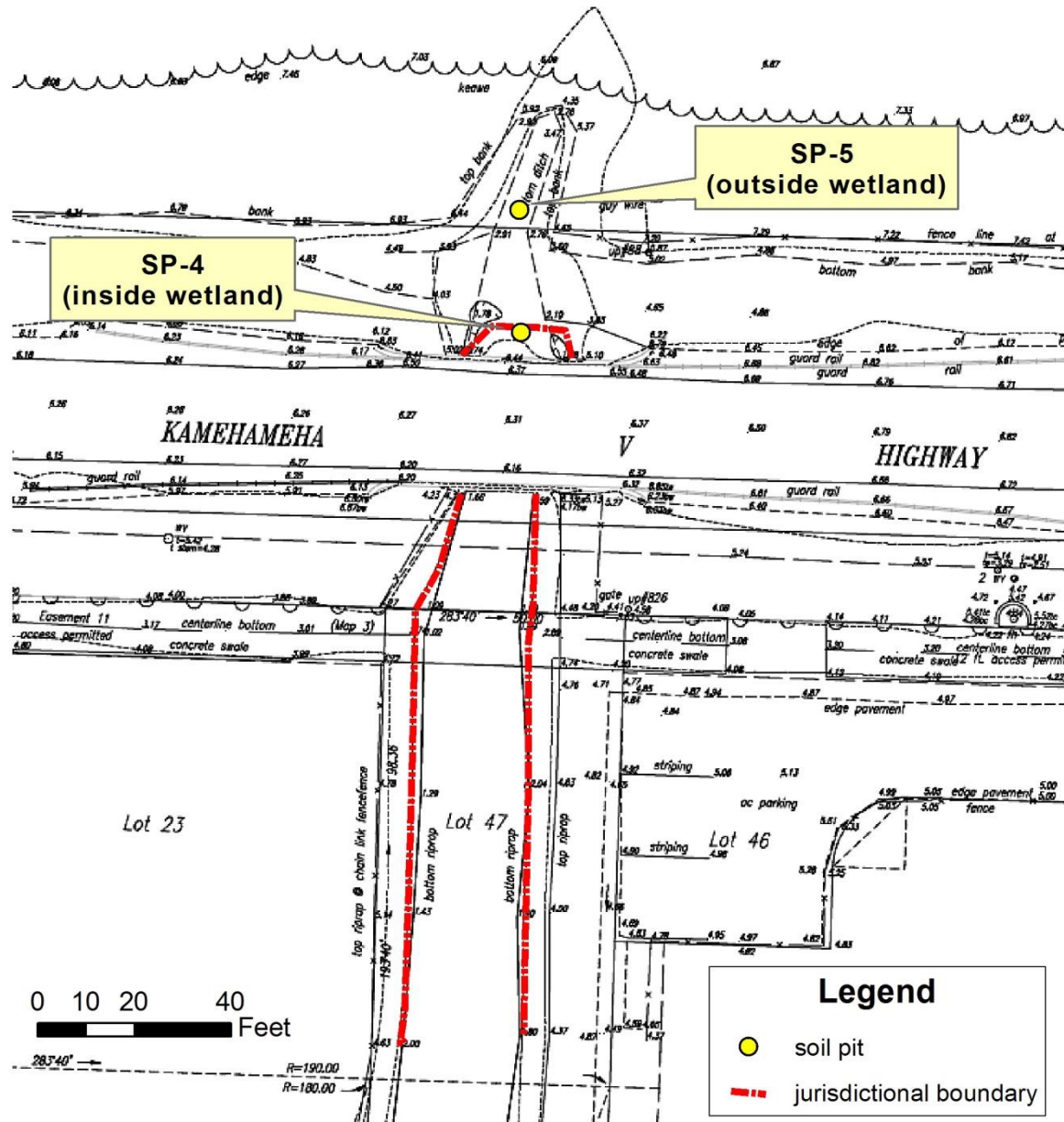


Figure 7. Figure showing *muliwai* boundaries within the Project site as determined on April 8, 2016.



Figure 8. Excavated channel upstream of bridge.

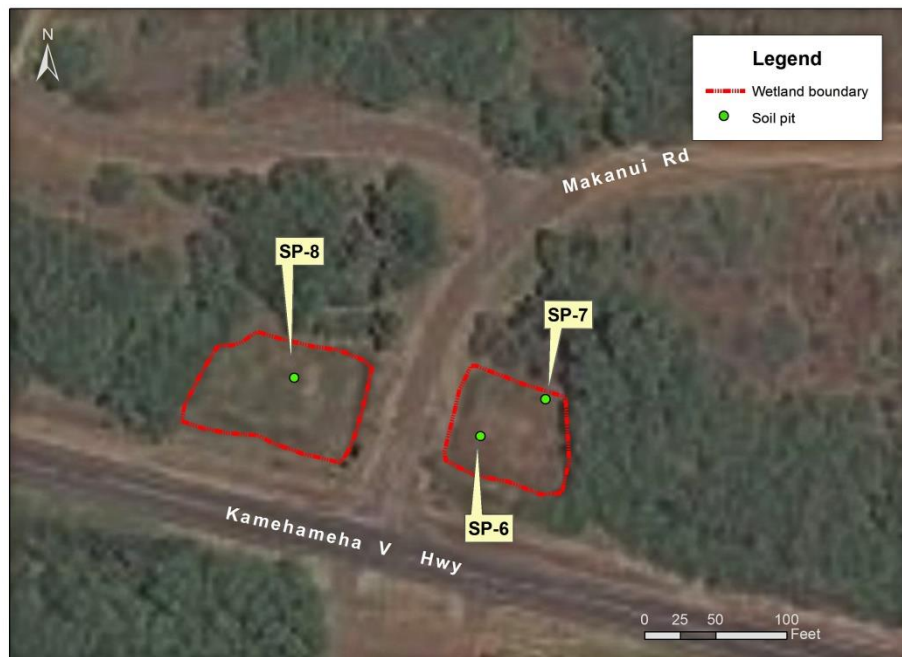


Figure 9. Retention basin wetland boundaries as determined on April 8, 2016.

Assessments

Aquatic Resources

No aquatic species (other than birds, as discussed below) listed as endangered or threatened under federal and state statutes (HDLNR, 2015; USFWS, 2016) were observed in Makakupa'ia Stream within the Project vicinity.

Though not an ideal environment, native diadromous organisms may inhabit or recruit to Makakupa'ia Stream when the sand berm at the stream mouth is open. No relationship has been found between local population density and habitat quality (McRae, 2007) and research indicates amphidromous fauna recruit to any freshwater source, regardless of habitat quality (Holmquist et al., 1998).

Terrestrial Plants

In total, 43 flowering plants (no ferns or conifers) were recorded. Of these 43 species, three species (7%) are cultivated or ornamental plants, six (14%) are considered to be species native to the Hawaiian Islands (indigenous; no endemic plants were observed), and one (2%) is an early Polynesian introduction (so-called "canoe plant"). No species of particular conservation interest or resource value occur here. No botanical resources protected or proposed for protection under state or federal statutes were observed in the area.

Avian and Mammalian Resources

The two mammals confirmed to utilize the Project area and sixteen of the nineteen bird species observed during the environmental survey are introduced or alien species. Six of the introduced species—Northern Cardinal, Cattle Egret, Mallard Duck, Western Meadowlark, Northern Mockingbird and House Finch—are on the list of migratory birds (USFWS, 2013) protected under the Migratory Bird Treaty Act (MBTA). The three native birds—*kōlea*, *ae'o*, and *'auku'u*—are also protected under the MBTA. All other introduced bird species and the mammals are not afforded special protections.

Ae'o is a slender endemic waterbird that prefers locations with shallow water with limited, or low-growing vegetation. The numerous nearby fishponds and tidal flats and the proposed staging areas are typical foraging habitat for *ae'o*. The overgrown *muliwai* is less suitable habitat but may be utilized in a limited way by the species. The species is listed as endangered by both federal (USFWS, 2016) and state (HDLNR, 2008) statutes.

'Auku'u is an indigenous water-obligate species that is commonly encountered close to just about any type of standing or running water across the state. The 'auku'u is listed as endangered by state statute (HDLNR, 2008).

Kōlea (Pluvialis fulva) is an indigenous migratory bird that nests in the high Arctic during the late spring and summer months, and returns to Hawai'i (and elsewhere) to spend the fall and winter months. The birds usually leave Hawai'i for the Arctic in late April or early May each year and return to wintering grounds in early August. Some individuals overwinter in Hawai'i and are present all year.

The Project, as proposed, is not likely to have adverse effects on *kōlea*, *ae'o*, or 'auku'u populations or habitat.

Ōpe'ape'a or Hawaiian hoary bat (*Lasiurus cinereus semotus*) is the only endemic land mammal in Hawai'i; Ōpe'ape'a is listed as endangered under federal and state of Hawai'i endangered species statutes (HDLNR, 2015; USFWS, 2016). Ōpe'ape'a have been documented in Moloka'i forests in Kalaupapa National Historic Park and Pālā'au State Park (Fraser et al, 2007). Two other confirmed sightings, one over the ocean along the southern shore and another in a residence occurred in Kamalō, 10 mi (16 km) east of the Project site (USFWS, 1998).

Ōpe'ape'a may fly over the area on occasion (bats were not surveyed for, as detection requires special equipment deployed at night) and the *kiawe* forest in Project area may have limited value as roosting habitat as the species has been documented to roost in *kiawe* trees (Mitchell et al, 2005). During the pupping season, females carrying pups may be reluctant to vacate a roost site if a pup is present and very small pups may be unable to flee a tree that is being felled. If large trees are not cut or are cut outside of the pupping season, the Project will likely not affect Ōpe'ape'a, a rare species on Moloka'i.

Recommendations

The following is a list of recommendations issued by the U.S. Fish and Wildlife Service (USFWS) in response to Endangered Species Act (ESA) consultation for this project in a letter dated June 30, 2016.

Hawaiian hoary bat: The temporary bypass road and the contractor's staging area will require clearing small areas of the *kiawe* forest adjacent to the highway. To avoid potential deleterious impacts to roosting bats, woody vegetation taller than 15 feet will not be removed during the Hawaiian hoary bat breeding season (between June 1 and September 15). To avoid potential impacts to foraging bats, no barbed wire will be used in fencing.

Seabirds: Hawaiian petrels and Newell's shearwaters may transit over the project area when flying between the ocean and nesting sites in the mountains during their breeding season (March through November). To avoid adversely impacting seabirds during construction, night work requiring artificial illumination will be avoided during the seabird fledging season (September 15 through December 15). If night-time construction or equipment maintenance activity is unavoidable, all associated lights will be shielded, and when large flood/work lights are used, they will be placed on poles that are high enough to allow the lights to be pointed directly downward at the ground.

Waterbirds: To minimize impact to ESA-listed waterbirds during construction, the project site will be surveyed prior to the start of work each day and periodically after any work stoppage of 30 minutes or more. Potentially disruptive activities (human activity, mechanical or construction disturbance) will be stopped if an ESA-listed species is observed within the project area, or enters the area while activities are occurring (within 100 feet), until the ESA-listed species voluntarily leave the area.

Nene: If nene are observed within the project area, all activity will be temporarily suspended until the animal leaves on its own accord.

The USFWS recommended Best Management Practices regarding soil erosion and sedimentation of aquatic environments will be implemented to minimize impacts to listed species.

Jurisdictional Waters

The U.S. Army Corps of Engineers (USACE) is likely to consider the stream channel and wetlands within the potential staging area to be jurisdictional under the Clean Water Act. Our jurisdictional delineations (shown in Figs. 7 and 9) are based upon best professional judgment.

Federal jurisdiction is solely determined by the USACE and is based upon the USACE accepting our delineation and may require a field visit by a USACE representative from the Regulatory Branch. Our delineation is not official until an acceptance letter from the USACE is received by the applicant. If project plans include work in jurisdictional waters or potentially jurisdictional waters, a Department of Army permit and Water Quality Certification will be needed. If, as anticipated by project planners, all work will avoid these waters, a "no permit required" letter could be requested from the USACE.

Upon learning the potential staging area was designed to function as a retention basin, project planners have identified a second potential staging area in the *kiawe* forest, east of the bridge that may be utilized for the project.

Critical Habitat

There is no federally delineated Critical Habitat for any species present on, adjacent, or in the vicinity of the Project. Thus the modification of the habitat on all or any part of the site will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under state law.

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Attachment 1

Wetland determination data
forms

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: Makakupaia City: Kawela Sampling Date: April 8, 2016 Time: 9:30 am
 Applicant/Owner: Maui County State/Terr./Comm.: Hawaii Island: Molokai Sampling Point: SP-1
 Investigator 1: Susan Burr Investigator 2: Chad Linebaugh TMK/Parcel: 54003:028
 Landform: coastal plain Local relief: concave
 Lat: 21 deg 04 min 12.14 sec North Long: 156 deg 57 min 58.20 sec West Datum: WGS84 Slope (%): 1
 Soil Map Unit Name: Mala silty clay, 0-3% slopes, MLRA 166 NWI classification: Upland

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☒ No ☐ (If no, explain in Remarks)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks:	SP-1 is within Flood Zone AE.		

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 1.5-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No <input type="checkbox"/>	Select <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
3.		No <input type="checkbox"/>	Select <input type="checkbox"/>
4.		No <input type="checkbox"/>	Select <input type="checkbox"/>
5.		No <input type="checkbox"/>	Select <input type="checkbox"/>
0 = Total Cover (sum)			
Sapling/Shrub Stratum (Plot size: 5 sq m)			
1. None		No <input type="checkbox"/>	Select <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
3.		No <input type="checkbox"/>	Select <input type="checkbox"/>
4.		No <input type="checkbox"/>	Select <input type="checkbox"/>
5.		No <input type="checkbox"/>	Select <input type="checkbox"/>
0 = Total Cover (sum)			
Herb Stratum (Plot size: 5 sq m)			
1. Cynodon dactylon	100	Yes <input type="checkbox"/>	FACU <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
3.		No <input type="checkbox"/>	Select <input type="checkbox"/>
4.		No <input type="checkbox"/>	Select <input type="checkbox"/>
5.		No <input type="checkbox"/>	Select <input type="checkbox"/>
6.		No <input type="checkbox"/>	Select <input type="checkbox"/>
7.		No <input type="checkbox"/>	Select <input type="checkbox"/>
8.		No <input type="checkbox"/>	Select <input type="checkbox"/>
100 = Total Cover			
Woody Vine Stratum (Plot size: 1.5-m radius)			
1. None		No <input type="checkbox"/>	Select <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species <u>0</u>	x 1	= <u>0</u>
FACW species <u>0</u>	x 2	= <u>0</u>
FAC species <u>0</u>	x 3	= <u>0</u>
FACU species <u>100</u>	x 4	= <u>400</u>
UPL species <u>0</u>	x 5	= <u>0</u>
Column Totals: <u>100</u> (A)		<u>400</u> (B)
Prevalence Index = B/A =		<u>4.00</u>

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ Problematic Hydrophytic Vegetation ¹ (Explain in Remarks or in the delineation report)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:	
----------	--

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks	
(inches)	Color	(moist)	%	Color (moist)					%
0-4	5YR 2.5/2		100	None		Select	Select	Silty Clay	Platy
4-18	5YR 2.5/2		100	None		Select	Select	Silty Clay	
				None		Select	Select	Select	
						Select	Select	Select	
						Select	Select	Select	
						Select	Select	Select	
						Select	Select	Select	
						Select	Select	Select	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators:**

select

Histisols (A1)
Histic Epipedon (A2)
Black Histic (A3)
Hydrogen Sulfide (A4)
Muck Presence (A8)
Depleted Below Dark Surface (A11)
Thick Dark Surface (A12)
Sandy Gleyed Matrix (S4)

select

Sandy Redox (S5)
Dark-Surface (S7)
Loamy Gleyed Matrix (F2)
Depleted Matrix (F3)
Redox Dark Surface (F6)
Depleted Dark Surface (F7)
Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

select

Stratified Layers (A5)
Sandy Mucky Mineral (S1)
Red Parent Material (TF2)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present: Yes ☐ No ☒

Remarks:

HYDROLOGY**Wetland Hydrology Indicators:** (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

Secondary Indicators (minimum of two required)

select

Surface Water (A1)
High Water Table (A2)
Saturation (A3)
Water Marks (B1)
Sediment Deposits (B2)
Drift Deposits (B3)
Algal Mat or Crust (B4)
Iron Deposits (B5)
Inundation Visible on Aerial Imagery (B7)
Water Stained Leaves (B9)

select

Aquatic Fauna (B13)
Tilapia Nests (B17)
Hydrogen Sulfide Odor (C1)
Oxidized Rhizospheres on Living Roots (C3)
Presence of Reduced Iron (C4)
Recent Iron Reduction in Tiled Soils (C6)
Thin Muck Surface (C7)
Fiddler Crab Burrows (C10) (Guam, CNMI, a
Other (Explain in Remarks)

select

Surface Soil Cracks (B6)
Sparsely Vegetated Concave Surface (B8)
Drainage Patterns (B10)
Dry-Season Water Table (C2)
Salt Deposits (C5)
Stunted or Stressed Plants (D1)
Geomorphic Position (D2)
Shallow Aquitard (D3)
FAC-Neutral Test (D5)

Field Observations:Surface Water Present? Yes ☐ No ☒ Depth (inches): NoneWater Table Present? Yes ☐ No ☒ Depth (inches): >18Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): >18Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

April 8, 2016

Project/Site: Makakupaia City: Kawela Sampling Date: ~~05/24/16~~ Time: 9:45 am
 Applicant/Owner: Maui County State/Terr./Comm.: Hawaii Island: Molokai Sampling Point: SP-2
 Investigator 1: Susan Burr Investigator 2: Chad Linebaugh TMK/Parcel: 54003:028
 Landform: coastal plain Local relief: concave
 Lat: 21 deg 04 min 12.18 sec North Long: 156 deg 57 min 58.14 sec West Datum: WGS84 Slope (%): 1
 Soil Map Unit Name: Mala silty clay, 0-3% slopes, MLRA 166 NWI classification: Upland

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☒ No ☐ (If no, explain in Remarks)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☒, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:	SP-2 is within Flood Zone AE. Vegetation may be absent due to flooding and long periods of inundation.		

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 3 sq m)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
2.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
3.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
4.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
5.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
		0 = Total Cover (sum)	

Sapling/Shrub Stratum (Plot size: 3 sq m)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
2.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
3.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
4.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
5.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
		0 = Total Cover (sum)	

Herb Stratum (Plot size: 3 sq m)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
2.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
3.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
4.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
5.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
6.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
7.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
8.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
		0 = Total Cover	

Woody Vine Stratum (Plot size: 3 sq m)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
2.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
		0 = Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1	= 0
FACW species 0	x 2	= 0
FAC species 0	x 3	= 0
FACU species 0	x 4	= 0
UPL species 0	x 5	= 0
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☒ Problematic Hydrophytic Vegetation ¹ (Explain in Remarks or in the delineation report)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present?

Yes ☒ No ☐

Remarks: Vegetation may be absent due to flooding and long periods of inundation.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks	
	Color	(moist)	%	Color (moist)					%
0-1	5YR 3/3		100	None		Select	Select	Sandy Clay Loam	Platy with gravel
1-4	5YR 3/3		100	None		Select	Select	Sandy Clay Loam	
4-12	5 YR 3/3		100	None		Select	Select	Loamy Sand	
						Select	Select	Select	
						Select	Select	Select	
						Select	Select	Select	
						Select	Select	Select	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators:**

select

Histisols (A1)

Histic Epipedon (A2)

Black Histic (A3)

Hydrogen Sulfide (A4)

Muck Presence (A8)

Depleted Below Dark Surface (A11)

Thick Dark Surface (A12)

Sandy Gleyed Matrix (S4)

select

Sandy Redox (S5)

Dark-Surface (S7)

Loamy Gleyed Matrix (F2)

Depleted Matrix (F3)

Redox Dark Surface (F6)

Depleted Dark Surface (F7)

Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

select

Stratified Layers (A5)

Sandy Mucky Mineral (S1)

Red Parent Material (TF2)

Very Shallow Dark Surface (TF12)

Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present:

Yes

☐

No

☒

Remarks:

HYDROLOGY**Wetland Hydrology Indicators:** (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

select

Surface Water (A1)

High Water Table (A2)

Saturation (A3)

Water Marks (B1)

Sediment Deposits (B2)

Drift Deposits (B3)

Algal Mat or Crust (B4)

Iron Deposits (B5)

Inundation Visible on Aerial Imagery (B7)

Water Stained Leaves (B9)

select

Aquatic Fauna (B13)

Tilapia Nests (B17)

Hydrogen Sulfide Odor (C1)

Oxidized Rhizospheres on Living Roots (C3)

Presence of Reduced Iron (C4)

Recent Iron Reduction in Tiled Soils (C6)

Thin Muck Surface (C7)

Fiddler Crab Burrows (C10) (Guam, CNMI, a

Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

select

Surface Soil Cracks (B6)

Sparsely Vegetated Concave Surface (B8)

Drainage Patterns (B10)

Dry-Season Water Table (C2)

Salt Deposits (C5)

Stunted or Stressed Plants (D1)

Geomorphic Position (D2)

Shallow Aquitard (D3)

FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): >12

Saturation Present? Yes ☒ No ☐ Depth (inches): 1

(includes capillary fringe)

Wetland Hydrology Present?

Yes

☒

No

☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Saturated from surface to 1-in depth.

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: Makakupaia City: Kawela Sampling Date: April 8, 2016
 Applicant/Owner: Maui County State/Terr./Comm.: Hawaii Island: Molokai Sampling Point: SP-3
 Investigator 1: Susan Burr Investigator 2: Chad Linebaugh TMK/Parcel: 54003:028
 Landform: coastal plain Local relief: concave
 Lat: 21 deg 04 min 12.35 sec North Long: 156 deg 57 min 58.12 sec West Datum: WGS84 Slope (%): 1
 Soil Map Unit Name: Mala silty clay, 0-3% slopes, MLRA 166 NWI classification: Upland

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☒ No ☐ (If no, explain in Remarks)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks:	SP-3 is within Flood Zone AE.		

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Prosopis pallida	5	Yes <input type="checkbox"/>	FACU <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
3.		No <input type="checkbox"/>	Select <input type="checkbox"/>
4.		No <input type="checkbox"/>	Select <input type="checkbox"/>
5.		No <input type="checkbox"/>	Select <input type="checkbox"/>
5 = Total Cover (sum)			
Sapling/Shrub Stratum (Plot size: 1-m radius)			
1. Prosopis pallida	10	Yes <input type="checkbox"/>	FACU <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
3.		No <input type="checkbox"/>	Select <input type="checkbox"/>
4.		No <input type="checkbox"/>	Select <input type="checkbox"/>
5.		No <input type="checkbox"/>	Select <input type="checkbox"/>
10 = Total Cover (sum)			
Herb Stratum (Plot size: 1-m radius)			
1. Cynodon dactylon	5	Yes <input type="checkbox"/>	FACU <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
3.		No <input type="checkbox"/>	Select <input type="checkbox"/>
4.		No <input type="checkbox"/>	Select <input type="checkbox"/>
5.		No <input type="checkbox"/>	Select <input type="checkbox"/>
6.		No <input type="checkbox"/>	Select <input type="checkbox"/>
7.		No <input type="checkbox"/>	Select <input type="checkbox"/>
8.		No <input type="checkbox"/>	Select <input type="checkbox"/>
5 = Total Cover			
Woody Vine Stratum (Plot size: 10-m radius)			
1. None		No <input type="checkbox"/>	Select <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1	= 0
FACW species 0	x 2	= 0
FAC species 0	x 3	= 0
FACU species 20	x 4	= 80
UPL species 0	x 5	= 0
Column Totals: 20 (A)		80 (B)
Prevalence Index = B/A =		4.00

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ Problematic Hydrophytic Vegetation ¹ (Explain in Remarks or in the delineation report)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:	
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Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks
	Color	(moist)	Color (moist)	%				
0-16	7.5YR	2.5/2	None	100	Select	Select	Sandy Clay	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators:**

select

Histisols (A1)
Histic Epipedon (A2)
Black Histic (A3)
Hydrogen Sulfide (A4)
Muck Presence (A8)
Depleted Below Dark Surface (A11)
Thick Dark Surface (A12)
Sandy Gleyed Matrix (S4)

select

Sandy Redox (S5)
Dark-Surface (S7)
Loamy Gleyed Matrix (F2)
Depleted Matrix (F3)
Redox Dark Surface (F6)
Depleted Dark Surface (F7)
Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

select

Stratified Layers (A5)
Sandy Mucky Mineral (S1)
Red Parent Material (TF2)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present: Yes ☐ No ☒

Remarks:

HYDROLOGY**Wetland Hydrology Indicators:** (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

select

Surface Water (A1)
High Water Table (A2)
Saturation (A3)
Water Marks (B1)
Sediment Deposits (B2)
Drift Deposits (B3)
Algal Mat or Crust (B4)
Iron Deposits (B5)
Inundation Visible on Aerial Imagery (B7)
Water Stained Leaves (B9)

select

Aquatic Fauna (B13)
Tilapia Nests (B17)
Hydrogen Sulfide Odor (C1)
Oxidized Rhizospheres on Living Roots (C3)
Presence of Reduced Iron (C4)
Recent Iron Reduction in Tiled Soils (C6)
Thin Muck Surface (C7)
Fiddler Crab Burrows (C10) (Guam, CNMI, a
Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

select

Surface Soil Cracks (B6)
Sparsely Vegetated Concave Surface (B8)
Drainage Patterns (B10)
Dry-Season Water Table (C2)
Salt Deposits (C5)
Stunted or Stressed Plants (D1)
Geomorphic Position (D2)
Shallow Aquitard (D3)
FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): >16

Saturation Present? Yes ☐ No ☒ Depth (inches): >16
(includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: Makakupaia City: Kawela Sampling Date: April 8, 2016
 Applicant/Owner: Maui County State/Terr./Comm.: Hawaii Island: Molokai Sampling Point: SP-4
 Investigator 1: Susan Burr Investigator 2: Chad Linebaugh TMK/Parcel: 54003:028
 Landform: coastal plain Local relief: concave
 Lat: 21 deg 04 min 11.78 sec North Long: 156 deg 57 min 56.86 sec West Datum: WGS84 Slope (%): 1
 Soil Map Unit Name: Mala silty clay, 0-3% slopes, MLRA 166 NWI classification: Upland

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☒ No ☐ (If no, explain in Remarks)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:	SP-4 is within Flood Zone AE. SP-4 is located near the mauka boundary of the wetland.		

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No <input type="checkbox"/>	Select <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
3.		No <input type="checkbox"/>	Select <input type="checkbox"/>
4.		No <input type="checkbox"/>	Select <input type="checkbox"/>
5.		No <input type="checkbox"/>	Select <input type="checkbox"/>
0 = Total Cover (sum)			
Sapling/Shrub Stratum (Plot size: 1-m radius)			
1. None		No <input type="checkbox"/>	Select <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
3.		No <input type="checkbox"/>	Select <input type="checkbox"/>
4.		No <input type="checkbox"/>	Select <input type="checkbox"/>
5.		No <input type="checkbox"/>	Select <input type="checkbox"/>
0 = Total Cover (sum)			
Herb Stratum (Plot size: 1-m radius)			
1. Bolboschoenus maritimus	25	Yes <input type="checkbox"/>	OBL <input type="checkbox"/>
2. Cynodon dactylon	12	Yes <input type="checkbox"/>	FACU <input type="checkbox"/>
3. Heliotropium curassavicum	8	No <input type="checkbox"/>	FAC <input type="checkbox"/>
4. Sesuvium portulacastrum	5	No <input type="checkbox"/>	FAC <input type="checkbox"/>
5.		No <input type="checkbox"/>	Select <input type="checkbox"/>
6.		No <input type="checkbox"/>	Select <input type="checkbox"/>
7.		No <input type="checkbox"/>	Select <input type="checkbox"/>
8.		No <input type="checkbox"/>	Select <input type="checkbox"/>
50 = Total Cover			
Woody Vine Stratum (Plot size: 10-m radius)			
1. None		No <input type="checkbox"/>	Select <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 25	x 1	= 25
FACW species 0	x 2	= 0
FAC species 13	x 3	= 39
FACU species 12	x 4	= 48
UPL species 0	x 5	= 0
Column Totals: 50 (A)		112 (B)
Prevalence Index = B/A =		2.24

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☒ 3 - Prevalence Index is ≤3.0¹
☐ Problematic Hydrophytic Vegetation ¹ (Explain in Remarks or in the delineation report)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:	
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Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth		Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks
(inches)		Color (moist)	%	Color (moist)	%				
0-9		7.5YR 3/2	95	7.5YR 5/8	5	C	PL	Silty Clay Loam	With gravel
						Select	Select	Select	
9-13		Gley 4/N	80	7.5 YR 3/2	20	D	M	Sandy Loam	With river rocks
						Select	Select	Select	
						Select	Select	Select	
						Select	Select	Select	
						Select	Select	Select	
						Select	Select	Select	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators:**

select

Histisols (A1)

Histic Epipedon (A2)

Black Histic (A3)

Hydrogen Sulfide (A4)

Muck Presence (A8)

Depleted Below Dark Surface (A11)

Thick Dark Surface (A12)

Sandy Gleyed Matrix (S4)

select

Sandy Redox (S5)

Dark-Surface (S7)

Loamy Gleyed Matrix (F2)

Depleted Matrix (F3)

Redox Dark Surface (F6)

Depleted Dark Surface (F7)

Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

select

Stratified Layers (A5)

Sandy Mucky Mineral (S1)

Red Parent Material (TF2)

Very Shallow Dark Surface (TF12)

Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present:

Yes



No



Remarks:

HYDROLOGY**Wetland Hydrology Indicators:** (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

select

Surface Water (A1)

High Water Table (A2)

Saturation (A3)

Water Marks (B1)

Sediment Deposits (B2)

Drift Deposits (B3)

Algal Mat or Crust (B4)

Iron Deposits (B5)

Inundation Visible on Aerial Imagery (B7)

Water Stained Leaves (B9)

select

Aquatic Fauna (B13)

Tilapia Nests (B17)

Hydrogen Sulfide Odor (C1)

Oxidized Rhizospheres on Living Roots (C3)

Presence of Reduced Iron (C4)

Recent Iron Reduction in Tiled Soils (C6)

Thin Muck Surface (C7)

Fiddler Crab Burrows (C10) (Guam, CNMI, a

Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

select

Surface Soil Cracks (B6)

Sparsely Vegetated Concave Surface (B8)

Drainage Patterns (B10)

Dry-Season Water Table (C2)

Salt Deposits (C5)

Stunted or Stressed Plants (D1)

Geomorphic Position (D2)

Shallow Aquitard (D3)

FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): >13

Saturation Present? Yes ☒ No ☐ Depth (inches): 9

(includes capillary fringe)

Wetland Hydrology Present?

Yes



No



Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Open water is present 0.4 m makai from SP-4.

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: Makakupaia City: Kawela Sampling Date: April 8, 2016 05/24/16 Time: 10:45 am
 Applicant/Owner: Maui County State/Terr./Comm.: Hawaii Island: Molokai Sampling Point: SP-5
 Investigator 1: Susan Burr Investigator 2: Chad Linebaugh TMK/Parcel: 54003:028
 Landform: other Local relief: concave
 Lat: 21 deg 04 min 12.00 sec North Long: 156 deg 57 min 56.85 sec West Datum: WGS84 Slope (%): 2
 Soil Map Unit Name: Mala silty clay, 0-3% slopes, MLRA 166 NWI classification: Upland

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☒ No ☐ (If no, explain in Remarks)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks:	SP-5 is near or within Flood Zone AE. SP-5 is within the excavated stream channel.		

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No <input type="checkbox"/>	Select <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
3.		No <input type="checkbox"/>	Select <input type="checkbox"/>
4.		No <input type="checkbox"/>	Select <input type="checkbox"/>
5.		No <input type="checkbox"/>	Select <input type="checkbox"/>
0 = Total Cover (sum)			
Sapling/Shrub Stratum (Plot size: 1-m radius)			
1. Prosopis pallida	10	Yes <input type="checkbox"/>	FACU <input type="checkbox"/>
2. Pluchea indica	5	Yes <input type="checkbox"/>	FAC <input type="checkbox"/>
3.		No <input type="checkbox"/>	Select <input type="checkbox"/>
4.		No <input type="checkbox"/>	Select <input type="checkbox"/>
5.		No <input type="checkbox"/>	Select <input type="checkbox"/>
15 = Total Cover (sum)			
Herb Stratum (Plot size: 1-m radius)			
1. A triplex semibaccata	10	Yes <input type="checkbox"/>	FAC <input type="checkbox"/>
2. Cynodon dactylon	12	Yes <input type="checkbox"/>	FACU <input type="checkbox"/>
3. Heliotropium curassavicum	5	No <input type="checkbox"/>	FAC <input type="checkbox"/>
4. Chad to id	5	No <input type="checkbox"/>	Select <input type="checkbox"/>
5.		No <input type="checkbox"/>	Select <input type="checkbox"/>
6.		No <input type="checkbox"/>	Select <input type="checkbox"/>
7.		No <input type="checkbox"/>	Select <input type="checkbox"/>
8.		No <input type="checkbox"/>	Select <input type="checkbox"/>
32 = Total Cover			
Woody Vine Stratum (Plot size: 10-m radius)			
1. None		No <input type="checkbox"/>	Select <input type="checkbox"/>
2.		No <input type="checkbox"/>	Select <input type="checkbox"/>
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1	= 0
FACW species 0	x 2	= 0
FAC species 20	x 3	= 60
FACU species 22	x 4	= 88
UPL species 0	x 5	= 0
Column Totals: 42 (A)		148 (B)
Prevalence Index = B/A =		3.52

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ Problematic Hydrophytic Vegetation ¹ (Explain in Remarks or in the delineation report)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:	
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Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth			Matrix			Redox Features			Type ¹	Loc ²	Texture	Remarks
(inches)	Color	(moist)		%		Color (moist)	%					
0-13	7.5YR 3/2			100		None			Select	Select	Sandy Clay	
									Select	Select	Select	
									Select	Select	Select	
									Select	Select	Select	
									Select	Select	Select	
									Select	Select	Select	
									Select	Select	Select	
									Select	Select	Select	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators:**

select

Histisols (A1)
Histic Epipedon (A2)
Black Histic (A3)
Hydrogen Sulfide (A4)
Muck Presence (A8)
Depleted Below Dark Surface (A11)
Thick Dark Surface (A12)
Sandy Gleyed Matrix (S4)

select

Sandy Redox (S5)
Dark-Surface (S7)
Loamy Gleyed Matrix (F2)
Depleted Matrix (F3)
Redox Dark Surface (F6)
Depleted Dark Surface (F7)
Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

select

Stratified Layers (A5)
Sandy Mucky Mineral (S1)
Red Parent Material (TF2)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present:

Yes ☐No ☒

Remarks:

HYDROLOGY**Wetland Hydrology Indicators:** (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

select

Surface Water (A1)
High Water Table (A2)
Saturation (A3)
Water Marks (B1)
Sediment Deposits (B2)
Drift Deposits (B3)
Algal Mat or Crust (B4)
Iron Deposits (B5)
Inundation Visible on Aerial Imagery (B7)
Water Stained Leaves (B9)

select

Aquatic Fauna (B13)
Tilapia Nests (B17)
Hydrogen Sulfide Odor (C1)
Oxidized Rhizospheres on Living Roots (C3)
Presence of Reduced Iron (C4)
Recent Iron Reduction in Tiled Soils (C6)
Thin Muck Surface (C7)
Fiddler Crab Burrows (C10) (Guam, CNMI, a
Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

select

Surface Soil Cracks (B6)
Sparsely Vegetated Concave Surface (B8)
Drainage Patterns (B10)
Dry-Season Water Table (C2)
Salt Deposits (C5)
Stunted or Stressed Plants (D1)
Geomorphic Position (D2)
Shallow Aquitard (D3)
FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): >13

Saturation Present? Yes ☐ No ☒ Depth (inches): >13
(includes capillary fringe)

Wetland Hydrology Present?

Yes ☐No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: Makakupaia City: Kawela Sampling Date: April 8, 2016
 Applicant/Owner: Maui County State/Terr./Comm.: Hawaii Island: Molokai Sampling Point: SP-6
 Investigator 1: Susan Burr Investigator 2: Chad Linebaugh TMK/Parcel: _____
 Landform: coastal plain Local relief: concave
 Lat: 21 deg 04 min 14.38 sec North Long: 156 deg 58 min 05.61 sec West Datum: WGS84 Slope (%): 0
 Soil Map Unit Name: Mala silty clay, 0-3% slopes, MLRA 166 NWI classification: Seasonally flooded palustrine wetland with persistent emergent vegetation*

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☒ No ☐ (If no, explain in Remarks)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:	SP-6 is within Flood Zone AE. * PEM1C		

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No <input type="checkbox"/>	Select <input type="text"/>
2.		No <input type="checkbox"/>	Select <input type="text"/>
3.		No <input type="checkbox"/>	Select <input type="text"/>
4.		No <input type="checkbox"/>	Select <input type="text"/>
5.		No <input type="checkbox"/>	Select <input type="text"/>
0 = Total Cover (sum)			
Sapling/Shrub Stratum (Plot size: 1-m radius)			
1. None		No <input type="checkbox"/>	Select <input type="text"/>
2.		No <input type="checkbox"/>	Select <input type="text"/>
3.		No <input type="checkbox"/>	Select <input type="text"/>
4.		No <input type="checkbox"/>	Select <input type="text"/>
5.		No <input type="checkbox"/>	Select <input type="text"/>
0 = Total Cover (sum)			
Herb Stratum (Plot size: 1-m radius)			
1. Bolboschoenus maritimus	10	Yes <input type="checkbox"/>	OBL <input type="text"/>
2. Cynodon dactylon	15	Yes <input type="checkbox"/>	FACU <input type="text"/>
3. Heliotropium curassavicum	20	Yes <input type="checkbox"/>	FAC <input type="text"/>
4. Sesuvium portulacastrum	5	No <input type="checkbox"/>	FAC <input type="text"/>
5.		No <input type="checkbox"/>	Select <input type="text"/>
6.		No <input type="checkbox"/>	Select <input type="text"/>
7.		No <input type="checkbox"/>	Select <input type="text"/>
8.		No <input type="checkbox"/>	Select <input type="text"/>
50 = Total Cover			
Woody Vine Stratum (Plot size: 10-m radius)			
1. None		No <input type="checkbox"/>	Select <input type="text"/>
2.		No <input type="checkbox"/>	Select <input type="text"/>
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1	= 0
FACW species 0	x 2	= 0
FAC species 0	x 3	= 0
FACU species 0	x 4	= 0
UPL species 0	x 5	= 0
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ Problematic Hydrophytic Vegetation ¹ (Explain in Remarks or in the delineation report)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Remaining ground is bare.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth			Matrix			Redox Features			Type ¹	Loc ²	Texture	Remarks
(inches)	Color	(moist)		%		Color (moist)	%					
0-3	10 YR 3/3			100		None			Select	Select	Muck	
3-9	Gley 1 3/N			100		None			D	M	Muck	
9-10	Limestone sand			50		Gley 1 3/N	50		D	M	Loamy Sand	Salt and pepper
									Select	Select	Select	
									Select	Select	Select	
									Select	Select	Select	
									Select	Select	Select	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators:**

select

Histisols (A1)

Histic Epipedon (A2)

Black Histic (A3)

Hydrogen Sulfide (A4)

Muck Presence (A8)

Depleted Below Dark Surface (A11)

Thick Dark Surface (A12)

Sandy Gleyed Matrix (S4)

select

Sandy Redox (S5)

Dark-Surface (S7)

Loamy Gleyed Matrix (F2)

Depleted Matrix (F3)

Redox Dark Surface (F6)

Depleted Dark Surface (F7)

Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

select

Stratified Layers (A5)

Sandy Mucky Mineral (S1)

Red Parent Material (TF2)

Very Shallow Dark Surface (TF12)

Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present:

Yes ☒No ☐

Remarks:

HYDROLOGY**Wetland Hydrology Indicators:** (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

select

Surface Water (A1)

High Water Table (A2)

Saturation (A3)

Water Marks (B1)

Sediment Deposits (B2)

Drift Deposits (B3)

Algal Mat or Crust (B4)

Iron Deposits (B5)

Inundation Visible on Aerial Imagery (B7)

Water Stained Leaves (B9)

select

Aquatic Fauna (B13)

Tilapia Nests (B17)

Hydrogen Sulfide Odor (C1)

Oxidized Rhizospheres on Living Roots (C3)

Presence of Reduced Iron (C4)

Recent Iron Reduction in Tiled Soils (C6)

Thin Muck Surface (C7)

Fiddler Crab Burrows (C10) (Guam, CNMI, a

Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

select

Surface Soil Cracks (B6)

Sparsely Vegetated Concave Surface (B8)

Drainage Patterns (B10)

Dry-Season Water Table (C2)

Salt Deposits (C5)

Stunted or Stressed Plants (D1)

Geomorphic Position (D2)

Shallow Aquitard (D3)

FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☒ No ☐ Depth (inches): 10

Saturation Present? Yes ☒ No ☐ Depth (inches): Surface

(includes capillary fringe)

Wetland Hydrology Present?

Yes ☒No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: Makakupaia City: Kawela Sampling Date: April 8, 2016 05/24/16 Time: 12:15 pm
 Applicant/Owner: Maui County State/Terr./Comm.: Hawaii Island: Molokai Sampling Point: SP-7
 Investigator 1: Susan Burr Investigator 2: Chad Linebaugh TMK/Parcel: _____
 Landform: coastal plain Local relief: concave
 Lat: 21 deg 04 min 14.62 sec North Long: 156 deg 58 min 05.16 sec West Datum: WGS84 Slope (%): 1
 Soil Map Unit Name: Mala silty clay, 0-3% slopes, MLRA 166 NWI classification: Upland

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☒ No ☐ (If no, explain in Remarks)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks:	SP-7 is within Flood Zone AE.		

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Callistemon viminalis	10	Yes <input type="checkbox"/>	UPL <input type="checkbox"/>
2. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
3. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
4. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
5. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
10 = Total Cover (sum)			
Sapling/Shrub Stratum (Plot size: 1-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Prosopis pallida	25	Yes <input type="checkbox"/>	FACU <input type="checkbox"/>
2. Pluchea indica	25	Yes <input type="checkbox"/>	FAC <input type="checkbox"/>
3. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
4. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
5. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
50 = Total Cover (sum)			
Herb Stratum (Plot size: 1-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
2. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
3. Heliotropium curassavicum	5	Yes <input type="checkbox"/>	FAC <input type="checkbox"/>
4. Sesuvium portulacastrum	5	Yes <input type="checkbox"/>	FAC <input type="checkbox"/>
5. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
6. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
7. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
8. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
10 = Total Cover			
Woody Vine Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No <input type="checkbox"/>	Select <input type="checkbox"/>
2. _____		No <input type="checkbox"/>	Select <input type="checkbox"/>
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1	= 0
FACW species 0	x 2	= 0
FAC species 35	x 3	= 105
FACU species 25	x 4	= 100
UPL species 0	x 5	= 0
Column Totals: 60 (A)		205 (B)
Prevalence Index = B/A =		3.42

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ Problematic Hydrophytic Vegetation ¹ (Explain in Remarks or in the delineation report)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Remaining ground is bare.

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features						
(inches)	Color	(moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-13	10 YR 3/3		100	None		Select	Select	Clay	With gravel
13-20	10 YR 3/1		80	None		Select	Select	Other (note in Remark	Mucky clay
	7.5 YR 3/1		20			Select	Select	Select	
20-23	10 YR 3/1		80	None		Select	Select	Clay	Gravelly clay
	7.5 YR 3/1		20			Select	Select	Select	
						Select	Select	Select	
						Select	Select	Select	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators:**

select

Histisols (A1)
Histic Epipedon (A2)
Black Histic (A3)
Hydrogen Sulfide (A4)
Muck Presence (A8)
Depleted Below Dark Surface (A11)
Thick Dark Surface (A12)
Sandy Gleyed Matrix (S4)

select

Sandy Redox (S5)
Dark-Surface (S7)
Loamy Gleyed Matrix (F2)
Depleted Matrix (F3)
Redox Dark Surface (F6)
Depleted Dark Surface (F7)
Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

select

Stratified Layers (A5)
Sandy Mucky Mineral (S1)
Red Parent Material (TF2)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present:

Yes ☐No ☒

Remarks:

HYDROLOGY**Wetland Hydrology Indicators:** (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

select

Surface Water (A1)
High Water Table (A2)
Saturation (A3)
Water Marks (B1)
Sediment Deposits (B2)
Drift Deposits (B3)
Algal Mat or Crust (B4)
Iron Deposits (B5)
Inundation Visible on Aerial Imagery (B7)
Water Stained Leaves (B9)

select

Aquatic Fauna (B13)
Tilapia Nests (B17)
Hydrogen Sulfide Odor (C1)
Oxidized Rhizospheres on Living Roots (C3)
Presence of Reduced Iron (C4)
Recent Iron Reduction in Tiled Soils (C6)
Thin Muck Surface (C7)
Fiddler Crab Burrows (C10) (Guam, CNMI, a
Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

select

Surface Soil Cracks (B6)
Sparsely Vegetated Concave Surface (B8)
Drainage Patterns (B10)
Dry-Season Water Table (C2)
Salt Deposits (C5)
Stunted or Stressed Plants (D1)
Geomorphic Position (D2)
Shallow Aquitard (D3)
FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): >23

Saturation Present? Yes ☒ No ☐ Depth (inches): 19
(includes capillary fringe)

Wetland Hydrology Present?

Yes ☐No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

April 8, 2016

Project/Site: Makakupaia City: Kawela Sampling Date: 05/24/16 Time: 12:45 PM

Applicant/Owner: Maui County State/Terr./Comm.: Hawaii Island: Molokai Sampling Point: SP-8

Investigator 1: Susan Burr Investigator 2: Chad Linebaugh TMK/Parcel:

Landform: coastal plain Local relief: concave

Lat: 21 deg 04 min 14.76 sec North Long: 156 deg 58 min 06.90 sec West Datum: WGS84 Slope (%): 0

Soil Map Unit Name: Mala silty clay, 0-3% slopes, MLRA 166 NWI classification: Seasonally flooded palustrine wetland with persistent emergent vegetation*

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☒ No ☐ (If no, explain in Remarks)Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

Remarks: SP-8 is within Flood Zone AE.
* PEM1C

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
2.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
3.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
4.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
5.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
0 = Total Cover (sum)			

Sapling/Shrub Stratum (Plot size: 1-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
2.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
3.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
4.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
5.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
0 = Total Cover (sum)			

Herb Stratum (Plot size: 1-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Bolboschoenus maritimus	10	Yes <input type="checkbox"/>	OBL <input type="button" value="Select"/>
2. Eleocharis radicans	8	Yes <input type="checkbox"/>	OBL <input type="button" value="Select"/>
3. Heliotropium curassavicum	5	No <input type="checkbox"/>	FAC <input type="button" value="Select"/>
4. Sesuvium portulacastrum	60	Yes <input type="checkbox"/>	FAC <input type="button" value="Select"/>
5.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
6.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
7.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
8.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
83 = Total Cover			

Woody Vine Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
2.		No <input type="checkbox"/>	Select <input type="button" value="Select"/>
0 = Total Cover			

Remarks: Remaining ground is bare.

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1	= 0
FACW species 0	x 2	= 0
FAC species 0	x 3	= 0
FACU species 0	x 4	= 0
UPL species 0	x 5	= 0
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0¹
- ☐ Problematic Hydrophytic Vegetation ¹ (Explain in Remarks or in the delineation report)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic

Vegetation

Present? Yes ☒ No ☐

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth			Matrix			Redox Features			Type ¹	Loc ²	Texture	Remarks
(inches)	Color	(moist)		%		Color (moist)	%					
0-6	7.5 YR 3/3			100		None			Select	Select	Sandy Clay	
6-11	10 YR 3/1			80		7.5 YR 3/3	20		C	PL	Sandy Loam	Distinct redox features
11-15	10 YR 4/1			100		None			Select	Select	Sandy Loam	
									Select	Select	Select	
									Select	Select	Select	
									Select	Select	Select	
									Select	Select	Select	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators:**

select

Histisols (A1)
Histic Epipedon (A2)
Black Histic (A3)
Hydrogen Sulfide (A4)
Muck Presence (A8)
Depleted Below Dark Surface (A11)
Thick Dark Surface (A12)
Sandy Gleyed Matrix (S4)

select

Sandy Redox (S5)
Dark-Surface (S7)
Loamy Gleyed Matrix (F2)
Depleted Matrix (F3)
Redox Dark Surface (F6)
Depleted Dark Surface (F7)
Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

select

Stratified Layers (A5)
Sandy Mucky Mineral (S1)
Red Parent Material (TF2)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present:

Yes



No



Remarks:

HYDROLOGY**Wetland Hydrology Indicators:** (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

select

Surface Water (A1)
High Water Table (A2)
Saturation (A3)
Water Marks (B1)
Sediment Deposits (B2)
Drift Deposits (B3)
Algal Mat or Crust (B4)
Iron Deposits (B5)
Inundation Visible on Aerial Imagery (B7)
Water Stained Leaves (B9)

select

Aquatic Fauna (B13)
Tilapia Nests (B17)
Hydrogen Sulfide Odor (C1)
Oxidized Rhizospheres on Living Roots (C3)
Presence of Reduced Iron (C4)
Recent Iron Reduction in Tiled Soils (C6)
Thin Muck Surface (C7)
Fiddler Crab Burrows (C10) (Guam, CNMI, a
Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

select

Surface Soil Cracks (B6)
Sparsely Vegetated Concave Surface (B8)
Drainage Patterns (B10)
Dry-Season Water Table (C2)
Salt Deposits (C5)
Stunted or Stressed Plants (D1)
Geomorphic Position (D2)
Shallow Aquitard (D3)
FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): >15

Saturation Present? Yes ☒ No ☐ Depth (inches): 7
(includes capillary fringe)

Wetland Hydrology Present?

Yes



No



Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B

Archaeological Assessment for Makakupaia Bridge Replacement Project Kawela Ahupuaa, Kona District, Island of Molokai

**ARCHAEOLOGICAL ASSESSMENT
MAKAKUPA'IA BRIDGE REPLACEMENT PROJECT
KAWELA AHUPUA'A, KONA DISTRICT,
ISLAND OF MOLOKA'I**

[TMK (2) 5-4-003:28 por. and (2) 5-4-017:44 por.]

Federal Aid Project No. STP-0450(010)



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Pacific Legacy: Exploring the past, informing the present, enriching the future.

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**ARCHAEOLOGICAL ASSESSMENT
MAKAKUPA‘IA BRIDGE REPLACEMENT PROJECT
KAWELA AHUPUA‘A, KONA DISTRICT, ISLAND OF MOLOKA‘I**

[TMK (2) 5-4-003:28 por. and (2) 5-4-017:44 por.]

Federal Aid Project No. STP-0450(010)

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8 March 2018

ABSTRACT

Pacific Legacy Inc., at the request of EKNA Services, Inc. on behalf of the Hawaii Department of Transportation (HDOT), conducted an Archaeological Assessment (AA) for the proposed replacement of the Makakupa‘ia Bridge, Kawela *Ahupua‘a*, Kona District, Island of Moloka‘i [TMK (2) 5-4-003:28 por. and (2) 5-4-017:44 por.] (Federal Aid Project No. STP-0450(010)). This project is being conducted under the auspices of the Federal Highways Administration (FHWA), the State of Hawai‘i Department of Transportation (HDOT) and is considered an “undertaking” under Section 106 of the National Historic Preservation Act (36 CFR Part 800). All methods and procedures governing an Archaeological Inventory Survey were followed (cf. HAR §13-276), however since no archaeological findings were made, this report is being issued as an Archaeological Assessment as per HAR § 13-275.5).

The proposed project consists of replacing the existing Makakupa‘ia Bridge. The Makakupa‘ia Bridge has been determined to be eligible for listing on both the National Register of Historic Places and the Hawaii Register of Historic Places and is thus considered a historic property. The surface survey did not identify any additional archaeological sites or resources. Eight backhoe trenches were excavated within the project APE. No subsurface cultural resources were uncovered.

The proposed bridge replacement project will have an “adverse effect” on the Makakupa‘ia Bridge. The Makakupa‘ia Bridge has had considerable modifications since its construction in 1940 that have compromised the integrity of the bridge. The integral features of the bridge and the modifications to the bridge have been well documented with written descriptions, photographs, and scaled drawings. These documents have mitigated the "adverse effect" that the project will have on this historic property. No further documentation of this bridge is recommended.

Given the lack of additional surface archaeological sites and no subsurface cultural deposits, no further archaeological work is recommended. However, in the unlikely event that potentially significant cultural resources, including human skeletal remains, are encountered during construction, work in the immediate area of the finding must halt and the SHPD Maui archaeologist must be notified (Barker Fariss [808-246-4626] or Jenney Pickett [808-243-5169]).

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Frontispiece: Overview of Makakupa‘ia Bridge (view southeast).

1.0 INTRODUCTION

Pacific Legacy Inc., at the request of EKNA Services, Inc. on behalf of the Hawaii Department of Transportation (HDOT), conducted an Archaeological Assessment (AA) for a proposed bridge replacement of the Makakupa‘ia Bridge, Kawela *Ahupua‘a*, Kona District, Island of Moloka‘i (TMK [2] 5-4-003:28 por. and (2) 5-4-017:44 por.] (Federal Aid Project No. STP-0450(010) (Figures 1-5). This project is being conducted under the auspices of the Federal Highways Administration (FHWA), the State of Hawai‘i Department of Transportation (HDOT) and is considered an “undertaking” under Section 106 of the National Historic Preservation Act (36 CFR Part 800). All methods and procedures governing an Archaeological Inventory Survey were followed (cf. HAR §13-276), however since no archaeological findings were made, this report is being issued as an Archaeological Assessment as per HAR § 13-275.5).

1.1 PROJECT AREA DESCRIPTION

The proposed project is located in the Kawela *ahupua‘a* on the island of Moloka‘i. The area of potential effect (APE) includes two areas (Figures 1-5):

1. The first area is a multi-sided shaped boundary located from approximately mile marker 3.85 to mile marker 4.02 along Kamehameha V Highway. This area includes the HDOT right-of-way (existing bridge and highway approaches) and adjacent property for the temporary bypass road (north of the highway). Total area is approximately 2.8 acres. The parcel on which the temporary bypass road is situated is TMK: (2) 5-4-003:028.
2. The second area is a rectangular shaped boundary located from approximately mile marker 4.13 to mile marker 4.16 along Kamehameha V Highway and north of the highway. This area includes the Contractor's staging area (approximately 0.5 acres). This area is located on TMK: (2) 5-4-003:028. The total area of the APE is approximately 3.3 acres.

The HDOT formally requested that the SHPD concur with the APE as defined above (Appendix A); SHPD concurred (Appendix B). The first 2.8-acre area consists of the Makakupa‘ia Bridge and the proposed bypass road. The second 0.5-acre area is the proposed construction staging area.

The proposed project consists of replacing the existing Makakupa‘ia Bridge. Construction tasks include: construct temporary bypass road, demolish existing bridge (leaving the existing abutments in place), and then construct new Makakupa‘ia Bridge, relocate utilities, construct highway transition to the new bridge, and install new pavement signing, striping and markings.

The purpose of the current AA is to determine if any significant archaeological sites or cultural resources are within the APE and if these resources will be impacted by the undertaking.

1.2 ENVIRONMENTAL SETTING

Average temperatures in the project area range between 70° F (21.1° C) in February to a high of 78° F (25.6° C) in August while the relative humidity is its lowest in June ca. 61% and is the highest in November at nearly 73% (Giambelluca et al. 2014). Rainfall in the area is minimal with less than 1 inch (25.4 mm) in September and maximum of nearly 3 inches (76.2 mm) in December (Giambelluca et al. 2014).

The Kawela area is dry nearly the entire year. Water flows in the stream drainages during heavy rainstorms. No perennial streams are present near the project area. The Makakupa‘ia Bridge crosses Makakupa‘ia stream, a dry streambed that has water flowing only during large storms. The *makai* side of the bridge contains some standing brackish water, the result of high tide and ocean surf, which flows up into the lower portion of the stream and then is trapped by the high level of beach sand at the stream mouth.

Vegetation in the vicinity of the project area consists of *kiawe* (*Prosopis pallida*), coconut (*Cocos nucifera*), *koa haole* (*Leucaena leucocephala*), and common grass.

1.2.1 Soils

The soils in the majority of the project area (Figure 6) are derived from the Mala Series, consisting of Mala silty clay (MmA), with a small area of the *mauka* portion of the project area consisting of Very stony land, eroded (rVT2) (Foote, et al. 1972: Sheet No. 77). The soil types are described below:

Mala Series

This series consists of well-drained soils on bottoms of drainageways and on alluvial fans on the coastal plains. These soils occur on the islands of Molokai and Lanai. They formed in recent alluvium. Elevations range from nearly sea level to 100 feet. The annual rainfall amounts to 10 to 25 inches. Most of it occurs between November and April. The summers are hot and dry; there is very little rain. The mean annual soil temperature is 75° F. Mala soils are geographically associated with Jaucus, Kealia, and Pulehu soils. These soils are used for pasture, alfalfa, truck crops, orchards, and wildlife habitat. The natural vegetation consists of *kiawe*, bristly foxtail, feather fingergrass, *ilima*, and Australian saltbush (Foote et al. 1972:92).

Mala silty clay, 0 to 3 percent slopes (MmA)

This soil is on fans along the coastal plains. In a representative profile the surface layer, about 7 inches thick, is dark reddish-brown silty clay that has platy structure. It is underlain by stratified layers of dark reddish-brown and very dark gray alluvium that is mostly silty clay. These layers are 47 to more than 59 inches thick. The soil is slightly acid to neutral in the surface layer and in the upper part of the subsoil and moderately alkaline in the lower part of the subsoil.

Permeability is moderate. Runoff is slow, and the erosion hazard is no more than slight. The available water capacity is about 1.4 inches per foot of soil. In places, roots penetrate to a depth of 5 feet or more. In low areas, this soil is subject to flooding for short periods during heavy rains. Many shallow wells have been dug in this soil.

The water is brackish, and care is required if it is used for irrigation purposes. The soil is easily compacted, and subsoiling may be necessary. This soil is used for pasture, alfalfa, truck crops, orchards, and wildlife habitat (Foote et al. 1972:92, 93).

Very Stony Land

This land type consists of areas where 50 to 90 percent of the surface is covered with stones and boulders. It is mapped on the islands of Maui, Molokai, and Lanai (Foote et al. 1972:124).

Very stony land, eroded (rVT2)

This land type consists of large areas of severely eroded soils on Molokai and Lanai. About 50 to 75 percent of the surface is covered with stones and boulders. There are common shallow gullies and a few deep gullies. The soil material is like that of the Holomua, Molokai, Pamoia, and Waikapu soils. In most places, it is less than 24 inches deep to bedrock, but it is deeper in a few low-lying areas. Slopes are mainly 7 to 30 percent, but they range from 3 to 40 percent.

This land type occurs in the same general area as Very stony land, but it is mostly upslope from those areas. Elevations range from sea level to 1,000 feet. The annual rainfall amounts to 10 to 25 inches. This land type supports a thicker stand of vegetation than Very stony land because it has more soil material. The dominant vegetation is kiawe, ilima, pilgrass, and fingergrass. These areas are used for pasture and wildlife habitat. Improvement of pasture is difficult because of the many stones and gullies, and in unimproved areas the carrying capacity is low. The habitat is excellent for axis deer. With a little improvement, excellent habitat for game birds can be established (Foote et al. 1972:124).



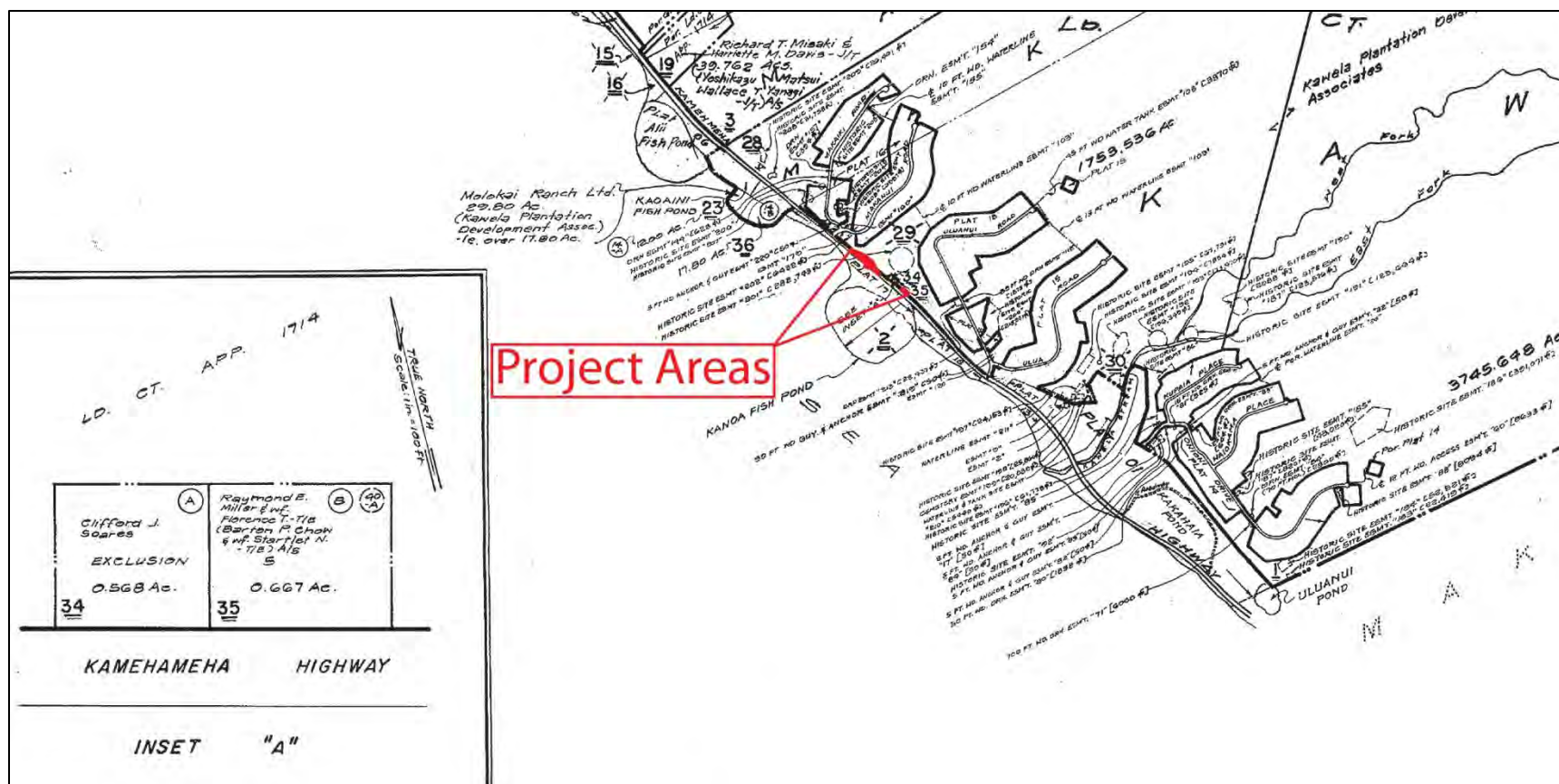


Figure 3. Project locations plotted in red on State Tax Map Key [TMK (2) 5-4-003:28 por. and (2) 5-4-017:44 por.].



Figure 5. Aerial image showing project locations. (Source: ESRI 2016 and GIS User Community).



Figure 6. Map showing soils within the project areas. (Source: ESRI 2016 and GIS User Community).

2.0 TRADITIONAL ACCOUNTS AND MO‘OLELO

2.1 TRADITIONAL ACCOUNTS

The island of Moloka‘i is imbued with elaborate oral traditions that account for the pre-Contact and early post-Contact history of the island as well as its many colorful legends and myths. According to Pukui et al. (1976:156), Moloka‘i is also referred to as *Moloka‘i nui a Hina* (great Moloka‘i, child of Hina) and *Moloka‘i pule o‘o* (lit. Moloka‘i [of the] potent prayer). It has been documented that some Moloka‘i *kūpuna* disagree with the conventional spelling for Moloka‘i. According to Kirkendall and Cleghorn (2009:95), two interviewees suggested the correct spelling is “Molokai,” although the conventional spelling since the resurgence of Hawaiian language classes in the 1970s and 1980s added the ‘*okina*.

The origin of Moloka‘i itself has many interpretations (Fornander 1916-1917, 1919-1920; Pukui et al. 1976; Kamakau 1991). In “The Song of Pakui,” Moloka‘i Island is said to be born of Wākea, who is seen as the ancestor of all Hawaiians, and his third wife, Hina (Fornander 1919-1920:360). Another traditional account of the island’s origin is told by the historian Kahakuikamoana. In the tradition of Opuukahonua, Hinanuiakalana birthed Moloka‘i with Kuluwaiea of Haumea as the father (Fornander 1916-1917:2). Alternatively, according to Fornander (1916-1917:12) some historians maintain that Wākea put his hands together and himself created the island. Yet another oral tradition holds that the islands were all magically grown from pieces of coral by a fisherman named Kapuheeuanui under the instruction of a priest named Lauliala‘amakua (Fornander 1916-1917:22).

Beckwith (1976) writes of one of the early mythos of Moloka‘i in the story of Pahulu, the goddess who once ruled over Lāna‘i, Moloka‘i, and a portion of Maui. In her account of this tale,

Pahulu was a goddess who came in very old times to these islands and ruled Lanai, Molokai, and a part of Maui. That was before Pele, in the days when Kane and Kanaloa came to Hawaii. Through her that “old highway” (to Kahiki), starts from Lanai. As Ke-olo-ewa was the leading spirit on Maui who possessed people and talked through them, so Pahulu was the leading spirit on Lanai. Lani-kaula, a prophet (kaula) of Molokai, went and killed off all the akua on Lanai. Those were the Pahulu family. Some say there were about forty left who came over to Molokai. The fishpond of Ka-awa-nui was the first pond they built on Molokai...Three of the descendants of Pahulu entered trees on Molokai. These were Kane-i-kaulana-ula (Kane in the red sunset), Kanei-ka-huila-o-ka-lani (Kane in the lightning), and Kapo. About four hundred trees sprang up in a place where no trees had been before, but only three of these trees were entered by the gods. The Lo family of Molokai, a family of chiefs and kahunas, are descended from Pahulu. Many of them are well-known persons today (Beckwith 1976:108).

Moloka‘i has also always been known as a center for learning, from the training of priests to the tradition of *hula*. Moloka‘i was known in pre-Contact times, as far back as the tenth century, as producing powerful *kāhuna* (Beckwith 1976:10,108; James 2001:121) and prophets (Summers 1971:13). In the story of Pahulu, “...About the time of Liloa and Umi, perhaps long before, chiefs flocked to Molokai. That island became a center for sorcery of all kinds. Molokai sorcery had more mana (power) than any other. Sorcery was taught in dreams. All these Molokai

aumakua were descendants of the goddess Pahulu..." Beckwith (1976:108). Though the exact location is not known, aspiring *kāhuna* were apprenticed at Kē'ie'ie in Mahana, which is in the Kaluako'i ahupua'a. According to James (2001), in the 12th century, Kaikololani, a warrior chief of Maui, brought his war fleet to Moloka'i and slaughtered scores of its people, which prompted the priests of Kē'ie'ie to deliver a deadly prayer, killing all warriors, save for Kaikololani, who returned to Maui to tell the tale of Moloka'i's great *kāhuna*. This story particularly upholds the island's poetic name of *Moloka'i pule o'o*. The famous sorcerer, prophet, and counselor, Lanikaula, was born in Puko'o and laid to rest in Keopukaloa, Moloka'i, sometime in the late-16th century. He is credited with killing all of the *akua* on Lāna'i (Beckwith 1976:108, 110-111). Moloka'i is also said to be the birthplace of the *hula* (Handy and Handy 1972:511; James 2001:121). It is said that a *wahine* from Moloka'i, named Laka, sometimes seen as a goddess or a manifestation of Kapo, was the creator of the *hula*. She is also credited with starting the first and most revered *hula* school at Mauna Loa, on the west end of Moloka'i.

Beckwith (1976) brings up some additional tales from pre-Contact Moloka'i, such as the story of Kao-hele, a noted runner from Moloka'i who was renowned for his remarkable skills. In the tale of Kao-hele, she outlines his feats, stating:

Kao-hele, noted runner of Molokai, is pursued in vain by Kahekili's men when they come to make war on Molokai. They station relays, but he outdistances them all, hence the saying, "Combine the speed to catch Kaohele" (E ku'i ka mama i loa o Kaohele). At one time chiefs and people are crowded at a famous cliff for the sport of leaping into the bathing pool below, and Kaohele, finding himself headed for this cliff and closely pursued, leaps across to the opposite bank, a distance of thirty-six feet. Kao-hele is runner and protector for four chiefs who live at the heiau of Kahokukano on Molokai and have a fishpond mountainward. He is killed by a slingstone in a battle with men from Hawaii but his chiefs escape (Beckwith 1976:339).

Although Moloka'i was typically subject to rule by O'ahu and Maui chiefs, who often fought for control over the small island, at times it was politically independent (Kirch 1985:7). The first recorded ruling chief of the island is Kamauaua, believed to have ruled sometime in the 13th century (Summers 1971:5; Fornander 1880). Later, there were a number of internal wars between chiefs of Ko'olau and Kona in the centuries that followed his victory. Though all failed to hold power for long, there were episodes of external conquest by chiefs of O'ahu, Maui, and Hawai'i (see Summers 1971 for details of these histories). Summers (1971) presents some of the genealogical information from the pre-Contact era and details the connections between Maui Island and Moloka'i which date back to the 16th century and Kihaapi'ilani.

The south side of Moloka'i was the scene of a large battle where invading forces of O'ahu (lead by Kapi'iohookalani) fought against the Moloka'i and Hawai'i chiefs lead by Alapa'i. The final battle was fought at Kawela. Kamakau writes:

On the fifth day at Kawela the decisive battle was fought. Every able-bodied man came out of his house to fight. The Molokai forces attacked from the hills, those of Hawaii from the sea, while a great number landed from the fleet and fought on land. The battle began in the morning and lasted until afternoon. The ruling chief of Oahu found himself surrounded by sea and by land and hemmed into a small space. Ka-pi'i-o-ho-o-ka-lani died at Kawela below Kamiloloa, and many chiefs and fighting men were slaughtered, but some escaped and sailed for O'ahu" (Kamakau 1992: 70-71).

There were a number of factors that gave Moloka‘i a reasonable amount of importance within the larger sociopolitical system of pre-Contact Hawai‘i. The island’s central position, and because it was most often without a strong political center, caused Moloka‘i to be a pawn in the 18th century pre-Contact wars of conquest. The island was a resource base for the support of armies and a staging area as they moved among the larger islands in the chiefly wars (Tuggle 1993a:10). An abundance of fish, as evidenced by the density of fishponds, was likely a lure to the island. Some of the most impressive *heiau* in all of Hawai‘i were built facing the numerous fishponds along the southern coast, which indicates the importance of these fishponds to the ruling chiefs in pre-Contact history. Another indicator is the presence of fine quality basalt, which was extensively quarried on the western end of the island (ibid).

2.2 HISTORICAL ACCOUNTS

The first historical descriptions of Moloka‘i are from Captain Cook. These descriptions were focused on the southwestern coast, as they harbored off of Kalaeloa, located near Kamalō Ahupua‘a. They described a scene with shelter from the trade winds, little wood, and yams (Cook 1785). About a decade later, Captain Vancouver described Moloka‘i’s south shore and stated that the valleys appeared “verdant and fertile”, with an abundant population and successful agriculture (Vancouver 1798: 201-203). William Ellis, an English Protestant missionary, arrived on Moloka‘i in the early 19th century and provided further commentary on the environment and people of Moloka‘i, indicating that there was little level topography, yet some areas evidence fertility, and estimated a population that exceeded Lāna‘i’s (Ellis 1917).

However, Moloka‘i was known as the Lonely Isle in the early 1800s, since it was not a common destination for foreign ships at the same time as the other major islands were discovering the novelty of foreign goods. Early population estimates range from 3,000 to 8,000 around the turn of the century (DeLoach 1970:126). The large discrepancy is due to population fluctuations caused by war and the introduction of foreign disease, and the difficulty in traversing the countryside to obtain a reliable count. By the end of the 19th century, the population had decreased dramatically to approximately 2,500 as vast amounts of people moved to the city centers on the more populated islands (DeLoach 1970:133).

European interaction and influence on the indigenous population of Moloka‘i began 31 years after Vancouver’s sojourn around the island. Moloka‘i was not immune to the influx of missionaries and other outsiders that came to the islands. The plantation and ranching era on Moloka‘i are inexplicably intertwined due to the course of history which shaped the commercial ventures of the 1800s and 1900s. The first 130 years of western impact was a time of trial and error in pursuit of a suitable cash crop, which would allow the island to participate in Hawai‘i’s new commercial economy. The difficulty was mostly due to the lack of sufficient quantities of fresh water in areas of potential large-scale agricultural production. Because no monetary enterprise was a lasting success, the majority of the population maintained the old ways (DeLoach 1970:130). During this time, the island’s population center shifted from the fertile east coast to the central south coast, and the land between Kalama‘ula and Kūmimi was said to be the most populated (Summers 1971).

3.0 HISTORIC BACKGROUND

The settlement patterns of Moloka‘i Island have been greatly influenced by this ecological diversity, and have been especially influenced by an uneven distribution of water resources, from prehistoric times up until present day. According to the first large-scale archaeological projects on Moloka‘i (Bonk 1954; Hammatt 1978; Kirch and Kelly 1975), the eastern fertile side of the island was likely the first to be populated. Initial settlement of the western portion of Moloka‘i was probably located along coastal areas that contained rich marine resources, such as Mo‘omomi and Kawākiu Nui. The exact population of Moloka‘i before European arrival is impossible to know. However, early missionaries provide estimates of 8,000 to 8,700 in the early 1830s, and there are indicators that the population was likely a few thousand greater before their arrival (Summers 1971:3).

The missionaries chose the southeastern coastal area of Kalua‘aha, for their home upon their arrival in 1832, and it is reasonable to assume that they would have chose this area not only for its richness in subsistence resources, but also because a substantial population was already present and easily reached. The southern shoreline, with its 54 or more fishponds constructed onto the broad reef flat, would have been renowned for its plentiful bounty and was home to a large population (Summers 1971). Before the arrival of Western influence, Moloka‘i’s subsistence economy was based on fishing, irrigated agriculture, gathering, and aquaculture in the form of man-made fishponds.

R. W. Meyer was, perhaps, one of the most innovative and influential individuals in the history of plantation/agriculture on Moloka‘i. Meyer was a multi-lingual immigrant from Germany who arrived on Moloka‘i in the 1840s. He married a local woman of Hawaiian and Samoan decent, and together settled in the uplands of Moloka‘i, in Kala‘e. His commercial ventures began with the introduction of a cattle ranch stocked with longhorn cattle, which he shipped to Honolulu (Judd 1936). Although Meyer’s efforts at animal husbandry were less than successful, he was quite successful in horticulture. He grew a variety of crops including: coffee, corn, wheat, and potatoes. His crowning achievement was the construction of a horse drawn sugar mill, which still stands, and has been restored. This unique sugar mill is on the National Register of Historic Places, thereby assuring R.W. Meyer a place in the early written histories of Moloka‘i (Kirkendall and Cleghorn 2009).

By the mid 19th century, Europeans were established on Moloka‘i, and able to purchase lands after the Māhele ‘Āina, which legislated private property ownership in the islands. However, Hawaiian royalty also expressed interest in the island. Kamehameha V was a frequent visitor, and purchased land from Hawaiians on Moloka‘i for his country home, Malama, located on the beach near Kaunakakai. The platform is still visible, although unmarked. The king also purchased cattle, which roamed the island at will due to their status as *kapu*. At his death, the estate of Kamehameha V (Lot Kapuāiwa) came to Charles R. Bishop through his wife, Bernice Pauahi Pākī Bishop. Through a *hui* action with individuals A.W. Carter, A.S. Hartwell, W.R. Castle, and J.B. Castle, the group amassed approximately 70,000 acres of fee simple land (Cooke 1949; Judd 1936; Tuggle 1993b).

Perhaps one of the darker periods in the history of Moloka‘i occurred when the Hansen Disease Colony in Kalaupapa was fully active. The colony was established the mid-19th century, but remained in use well into the modern era, even after treatment was available for the disease.

Between 1870 and 1900, several larger-scale sugar plantations were started on Moloka‘i. One was at Moanui, but the Mill burned down. Another mill operated at Kamalō, but evidence suggests that by 1900, neither were in operation. Remnants of the pier at Kamalō and stone ruins at Moanui are visible today. In 1898, the American Sugar Company incorporated and started a sugar plantation on the plains of Moloka‘i. Subsequently, the American Sugar Company constructed a harbor and pier, as well as a railroad from the end of the pier to Pālā‘au on the Ho‘olehua plateau. The initial property was on 750 acres of which 500 were planted in young sugar cane. Water, or lack thereof, proved to be a reoccurring theme for the plantation. To address this issue, the company excavated irrigation ditches and dug wells in the lowlands, with steam pumps of 10,000,000 gallon capacity to lift the water (Judd 1936). This rapid removal of water decimated the freshwater aquifer, and drew brackish and sea water inland to the fields. As this unfortunate event destroyed the cane crops, American Sugar Company was forced into economic demise (Kirkendall and Cleghorn 2009). Sugar cultivation attempts at Kamalō and Moanui were more successful, albeit, by a small margin.

Continued economic distress created a need for another economic outlet. By 1920, Moloka‘i Ranch comprised the chief economic venture on the island in the form of beef cattle. Its success came at the decline of sheep, honey, and taro exports. According to Cooke (1949), the total area devoted to cattle production and grazing included 89,428.811 acres, 64,104.811 of which were fee simple and 25,324 constituted leased Government lands.

However, the first 20 years of the 20th century were not without economic trouble. A severe drought threatened the entire operation in 1908 (Cooke 1949). George Paul Cooke, soon-to-be ranch manager, stated that only 13.94 inches of rain fell at Kualapu‘u; the lowest since Governmental recordation began. At least five hundred head of cattle were lost to thirst and starvation. Ranch stockholders did not receive a positive dividend on their investments until ten years after the drought (Cooke 1949).

In 1918, a proposal by Hawaiian Pineapple Company Ltd. was submitted to lease these lands for pineapple production upon the expiration of government land leases in Ho‘olehua, Pālā‘au, and Kalama‘ula. In 1922, pineapple cultivation on Moloka‘i spread to the west end of the Kaluako‘i *ahupua‘a*. Lands above the five hundred foot elevation were leased to Libby, McNeill, and Libby for pineapple. Libby established a cable landing at Pu‘u Kai‘aka, north of Pāpōhaku Beach because of poor roads and transport systems. A few years later, Libby’s expansion allowed for excavation and construction of a channel and wharf at Kaumanamana serving tug boats and barges, which was named “Kolo,” as Kaumanamana proved difficult to pronounce (Cooke 1949).

The California Packing Company (CPC) obtained a lease to raise pineapples at Kalae and Pu‘u o Hōkū at about the same general time frame (1919). In 1927, CPC lands expanded through additional lease agreements for lands at Nā‘iwa and Kahanui. Additionally, a CPC ranch

employee camp was constructed at Kualapu‘u and the company took over ranch lands and the camp at Ma‘ālehu, renaming it Kīpū (Kirkendall and Cleghorn 2009).

In 1920, Moloka‘i Ranch, under G.P. Cooke, tried their hand at dairy farming as Mapulehu Dairy (Cooke 1949). The dairy cows were raised on corn and alfalfa, which proved to be successful. Raw milk from the Mapulehu Dairy was exported to Leahi Home (tuberculosis hospital) in Honolulu. This venture flourished for a number of years until 1933, when someone poisoned 16 of the cows with arsenic in the feed. The operation closed in Mapulehu, and moved to Kauluwai, which was in operation until at least 1949 (Cooke 1949).

The Hawaiian Homes Act was established in 1921, in a clear effort to allow native Hawaiians the opportunity to boost their standard of living by providing an economic outlet via homesteading (Kirkendall and Cleghorn 2009). Properties became available as homestead lands on Moloka‘i in Kalama‘ula Ahupua‘a, which was initially called the Kalaniana‘ole Settlement. Subsequently, other homestead areas were made available in Ho‘olehua and Pālā‘au Ahupua‘a, on former Moloka‘i Ranch lands. Moloka‘i Ranch leased these lands primarily for the raising of pineapples. At this time, just 40 acre plots in Ho‘olehua were made available to applicants. In the spirit of self-sufficiency, homesteaders raised cattle, horses, sheep, chickens, pigs, and vegetables (Kirkendall and Cleghorn 2009). Seventy-nine homesteading families came to Moloka‘i in the first year deeming the program a success (DeLoach 1970:136). The island has since maintained a more traditional way of life than other islands thanks to its relatively low population of which a high percentage is native Hawaiian, and there is a strong sentiment against outside interference in land affairs.

3.1 LAND COMMISSION AWARDS

Private land ownership was established in Hawai‘i with the Māhele ‘Āina, also known as the Great Māhele of 1848. Crown and *ali‘i* lands were awarded in 1848 and *kuleana* titles were awarded to the general populace in 1850 (Chinen 1958). Awarded lands in this process are referred to as Land Commission Awards (LCAs). Over time, government lands were sold off to pay government expenses. The purchasers of these lands were awarded Grants or Royal Patent Grants (Chinen 1958). LCAs offer the native and foreign testimonies recorded during the claiming process, which shed light on what the land use of the area was in the early historic period. This information can be used to predict the types of resources may still be present in the project area.

Research conducted indicates no LCAs were awarded within the current project area although eight LCAs were claimed in the vicinity. The results are presented below in Table 1 and maps showing their locations are presented in Appendix C.

Table 1. Land Court Awards near Project Area

LCA No.	Claimant	Awarded	Royal Patent No.	Testimony	Claim
160-B	Kapuahalio	Yes	4431	Vol. 6, page 149 ² Vol. 6, page 39 ³	
3677	Meau	Yes	6055	Vol. 7, page 33 ¹ Vol. 6, page 148 ² Vol. 6, page 39 ³	Taro pastures
3910	Nalaalau	Yes	3722	Vol. 7, page 57 ¹ Vol. 6, page 148 ² Vol. 6, page 39 ³	Taro pasture
4176	Kanemanaole	Yes	6244	Vol. 6, page 144 ² Vol. 6, page 39 ³ Vol. 15, page 233 ³	Pasture
6761	Ehu	Yes	6243	Vol. 7, page 223 ¹ Vol. 6, page 149 ² Vol. 6, page 39 ³ Vol. 15, page 165 ³ Vol. 15, page 235 ³	Not Found
8559-B	Lunalilo, WM. C.	Yes	7656	No testimony	Mokolelau Paddock
9988	Lio	Yes	3721	Vol. 7, page 283 ¹ Vol. 6, page 148 ² Vol. 6, page 39 ³ Vol. 15, page 234 ³	House lot
10107	Maunaloa	Yes	6056	Vol. 7, page 283 ¹ Vol. 6, page 148 ² Vol. 6, page 39 ³ Vol. 15, page 234 ³	Taro pasture

¹ Native Register (on file at the State Archives)

² Native Testimony (on file at the State Archives)

³ Foreign Testimony (on file at the State Archives)

4.0 PREVIOUS ARCHAEOLOGY

The earliest archaeological work on the island of Moloka'i involved non-intensive island-wide surveys that identified only the largest and most prominent sites (Monsarrat n.d.; Cobb 1902; Cooke 1949; Stokes n.d.; Emory n.d.; Dunn n.d.). More recently, several archaeological investigations have been conducted in the vicinity of the current project, although no previous archaeological sites have been identified within the current project area. The locations of the previous archaeological investigations that are relevant to the current project are shown in (Figure 7). The previous archaeological studies are listed in Table 2 and a more detailed summary description of each project is presented below.

In 1971, Catherine Summers compiled the first comprehensive list of archaeological sites for the island of Moloka'i (Summers 1971). She identified eight archaeological sites located within the *ahupua'a* of Kawela (SIHP 50-60-04-137 through SIHP 50-60-04-144). SIHP 50-60-04-137, Kanoa Fishpond, is located *makai* and outside of the current project area.

In 1979, Environment Impact Study Corp. conducted an archaeological reconnaissance survey and subsurface archaeological testing of approximately 19.678 acres situated in between Kanoa Fishpond and Kamehameha V Highway for the Kanoa Beach Lots project located *makai* of the current project area (Bordner and Cox 1979). Other than Kanoa Fishpond, SIHP 50-60-04-137, no surface archaeological features were identified during the reconnaissance survey. At the time of the survey, Kanoa Fishpond consisted of partially intact wall segments of the former fishpond. No cultural material was noted of the surface of the fishpond walls. The report did not identify a site number for Kanoa Fishpond. The subsurface testing of 20 test cores was conducted with a hand auger and no cultural material or subsurface archaeological features were identified. Analysis of the test cores suggested that area behind the fishpond had been subject to frequent flooding, as evidenced by the presence of silt in the cores. No indication of agricultural activities behind the fishpond was noted. Due to the lack of cultural materials, no further work was recommended for project, however, preservation of the intact portions of the fishpond wall was recommended.

In 1980, Marshall Weisler and Patrick V. Kirch conducted an archaeological reconnaissance survey of approximately 450 acres for the Kawela Plantation Development Associates (KPSA) project (Units 1, 2, and 3) located in the *ahupua'a* of Kawela and Makakupa'ia, situated *mauka* of the current project area (Weisler and Kirch 1980). The survey identified 79 previously unknown archaeological sites. In addition, the survey relocated three previously recorded sites (SIHP 50-60-04-141, a petroglyph boulder; SIHP 50-60-04-142, a house site with attached shrine; and SIHP 50-60-04-144, a burial mound) bringing the total number of known sites within their project area to 82. These 82 archaeological sites consisted of 331 total features. The identified features consisted of a broad variety of archaeological features including shrines, petroglyphs, platforms, L-, C-, U- shaped structures, enclosures, surface midden and lithic scatters, dune midden and burials, terraces, modified outcrops, walls, an alignment, windbreak shelters, cairns (*ahu*), a *hōlua* slide, and a platform or ramp. Sites were assigned temporary numbers (T-x) pending further work. None of these sites are located in the immediate vicinity of the current

project area. The entire KPDA project included approximately 6,000 acres, however, based on the initial reconnaissance survey it appeared that the majority of archaeological sites were located below the 600-foot contour line. This comprised an area of approximately 1,190 acres within the overall KPDA project area. Due to the significant findings of the initial reconnaissance survey, the report recommended that the sites with high interpretive value be set aside for preservation, including a historic preserve in one specific site complex area (T-81). As part of the preservation of these selected sites, it was recommended that they be nominated to the State Register of Historic Places and should all be excluded from ownership in fee simple. In other words, they should be placed with easements and restrictions on use. They recommended that a reconnaissance level survey of the entire KPDA project area (below the 600 foot contour line) be completed. They recommended a program of detailed archaeological study to recover significant information from sites with high research potential, and lastly, it was recommended that local members of the community be involved in the ongoing archaeological work at Kawela.

In 1981, Marshall Weisler conducted archaeological investigations of the Kakahai‘a National Wildlife Refuge (KNWR) for a reed removal project located approximately 2.0 km east of the current project area (Weisler 1981). The investigations consisted of a pedestrian survey and ten subsurface auger borings in order to identify any potential cultural resources. No prehistoric cultural resources were identified during the investigations. The lack of prehistoric findings was partially attributed to the dynamic nature of the alluvial plain where the pond is located. Two historic archaeological sites were identified during the surface survey. The first site consisted of a wooden house, stone-lined well, and piggery located immediately northwest of the pond. The second site consisted of an additional piggery and charcoal manufacturing site located east of the pond. The report recommended that the two historic archaeological sites identified by the study be avoided during the removal of the reeds from the pond. No site numbers were designated at that time.

In 1982, Marshall Weisler and Patrick V. Kirch produced a summary of their archaeological investigations that had been conducted in 1980 (Weisler and Kirch 1980) for the Kawela Plantation Development Associates (KPDA) project (Units 1, 2, and 3) located in the *ahupua‘a* of Kawela and Makakupa‘ia, *mauka* of the current project area (Weisler and Kirch 1982). This report primarily outlined the evaluations of the nature and significance of the identified archaeological sites and the recommendations for their long-term management. In addition, the report discussed the complete reconnaissance survey of the KPDA project area up to the 500-ft contour line, which resulted in the identification 182 archaeological sites, comprised of 499 archaeological features. This report provided a summary listing of these features, organized by basic feature type. It was apparently during this complete portion of the Kawela survey that the sites located nearest to the current project area were identified and recorded. SIHP 50-60-04-721 (T-155, T-158) is located just *mauka* of the current Makakupa‘ia Bridge reroute project area and consists of a prehistoric residential complex comprised of 11 features including shelters, enclosures, one *ahu* with cupboard, one wall with adjoining terrace, and one platform with adjoining terrace. SIHP #721 was nominated to the National Register of Historic Places (NRHP) in 1981. Site T-152 is located just northeast of the Makakupa‘ia Bridge project lay down area and consists of five prehistoric temporary habitation terraces.

Site T-153 is located just *mauka* of the Makakupa‘ia Bridge lay down project area and consists of a prehistoric L-shaped temporary habitation shelter. None of these sites are located within the current project area.

In 1983, Marshall Weisler produced a summary of his previous archaeological investigations of the Kakahai‘a National Wildlife Refuge (KNWR) conducted in 1981 (Weisler) for a reed removal project located approximately 2.0 km east of the current project area (Weisler 1983). The report reiterated that no prehistoric archaeological sites were identified during the pedestrian survey and auger testing. This report did note three historic archaeological sites that were identified, as opposed to the two previously discussed in the 1981 report. The three historic sites consisted of an abandoned residence, a piggery and charcoal manufacturing site, and a residence, a piggery, and a well. Only temporary site numbers were designated at that time. In addition to the results of the survey and auger testing, the report presented a geomorphological reconstruction for the area around the Kakahai‘a National Wildlife Refuge.

In 1985, Marshall Weisler and Patrick V. Kirch published a summary of their archaeological investigations that had been conducted in 1980 and 1982 for the Kawela Plantation Development Associates (KPDa) project (Units 1, 2, and 3) located in the *ahupua‘a* of Kawela and Makakupa‘ia, situated *mauka* of the current project area (Weisler and Kirch 1985). This summary focused primarily on the structure of settlement space within the project area where 499 archaeological features had been identified. In addition, subsurface excavation was conducted at 72 of these archaeological features resulting in an excavated sample of 442.5 square meters. Radiocarbon dates obtained during excavations established that virtually the entire settlement landscape dated to a period from about A.D. 1650 to 1820.

In 2006, Archaeological Services Hawaii, LLC conducted an archaeological assessment of an approximately 0.5 acre oceanfront parcel located in Kawela *ahupua‘a* approximately 145 m (m) west of the current project area (Pantaleo 2006). The assessment included a historical and archaeological background search in order to improve site predictability. A surface survey of the project area did not identify any archaeological features, although previous disturbances from adjacent construction activities were noted. In addition to the surface survey, five subsurface backhoe trenches were excavated throughout the parcel. No subsurface archaeological features or cultural materials were identified by the backhoe excavations. No further work was recommended for the project.

In 2006, Scientific Consultant Services, Inc. (SCS) conducted an archaeological inventory survey as part of the Final Environmental Assessment for the Kawela Bridge Replacement project located approximately 1.5 km east of the current project area (McGerty and Spear 2008). The survey identified one archaeological site. SHIP #50-60-04-2478 consisted of three traditional rock faced agricultural terraces located within a side swale situated along the main drainage of Kawela Stream. In addition, the AIS documented two previously identified archaeological sites located in close proximity to the project area. SIHP 50-60-04-139 is the Paliku Battlefield, and SIHP 50-60-04-144 is a burial sand dune associated with the battlefield. No further work was recommended for the terraces, however, archaeological monitoring was recommended during ground disturbing activities based on the presence of previously recorded archaeological sites near the project area.

In 2013, International Archaeological Research Institute, Inc. (IARII) conducted an archaeological assessment with subsurface testing of an approximately 0.39 acre parcel located at 2238 Kamehameha V Highway approximately 200 m west of the current project area (Pacheco 2013). No archaeological features were identified during the surface survey of the property. The subsurface testing consisted of seven shovel test pits excavated in the areas planned for ground disturbing construction activities. No significant subsurface archaeological features or cultural materials were encountered during test excavations. No further work was recommended for the project.

In 2015, Archaeological Services Hawaii, LLC. conducted archaeological monitoring for the Kawela Bridge Replacement project located approximately 1.5 km east of the current project area (O'Claray-Nu et al. 2015). No archaeological features or burials were encountered during the course of the archaeological monitoring. One possible traditional hammerstone was recovered during excavations along the east side of the bridge. Disturbed historic material consisting of beverage bottles and cans, concrete fragments, galvanized pipes, and fencing material were also encountered. Concrete foundation materials consisting of concrete steps and concrete block fragments were also identified and maybe associated with the former school or church site although it was unclear. No further work was recommended for the project, however, if future ground disturbing activities were planned for the eastern side of the bridge and stream, archaeological monitoring was recommended due to the presence of the remnant sand dune and nearby burial site, SIHP 50-60-04-144. Further inspection of the concrete foundation materials and concrete steps that were encountered during monitoring was also recommended if future ground-disturbing activities were planned.

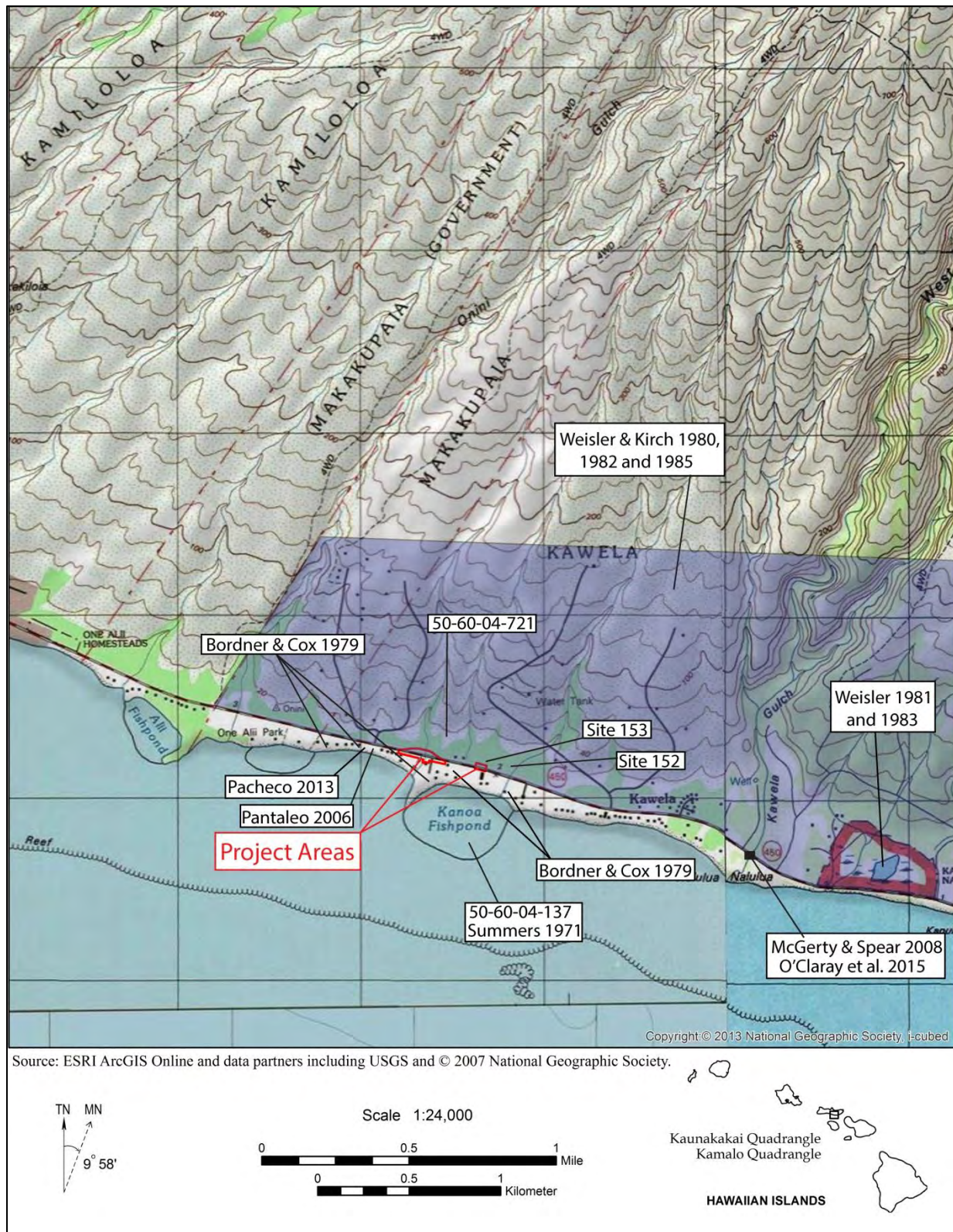


Figure 7. Locations of previous archaeological investigations in vicinity of the project areas.

Table 2. Summary of Previous Archaeological Investigations

Author	Location	Type of Study	Findings (SIHP #50-60-04-xxxx)
Summers 1971	Island wide	Island-wide survey	(SIHP #-137 through 144) Only SIHP #-137, Kanoa Fishpond, is located near the current project area.
Bordner and Cox 1979	Kanoa Beach Lots Project located <i>makai</i> of current project area	Archaeological Reconnaissance Survey and Subsurface Testing	SIHP #-137, Kanoa Fishpond. No other archaeological features identified.
Weisler and Kirch 1980	Kawela Plantation Development Associates (KPDa) Project located in Kawela and Makakupa‘ia <i>ahupua‘a</i> , <i>mauka</i> of current project area	Archaeological Reconnaissance Survey	Identified 82 sites consisting of 331 features.
Weisler 1981	Kakahai‘a National Wildlife Refuge	Archaeological Pedestrian Survey and Auger Testing	Identified two historic sites. No other archaeological features identified.
Weisler and Kirch 1982	Kawela Plantation Development Associates (KPDa) Project located in Kawela and Makakupa‘ia <i>ahupua‘a</i> , <i>mauka</i> of current project area	Archaeological Reconnaissance Survey	Identified 182 sites consisting of 499 features.
Weisler 1983	Kakahai‘a National Wildlife Refuge	Archaeological Pedestrian Survey and Auger Testing	Identified three historic sites. No other archaeological features identified.
Weisler and Kirch 1985	Kawela Plantation Development Associates (KPDa) Project located in Kawela and Makakupa‘ia <i>ahupua‘a</i> , <i>mauka</i> of current project area	Archaeological Reconnaissance Survey and Data Recovery	Identified 182 sites consisting of 499 features. Excavated 72 features totaling 442.5 square meters. Radiocarbon dates from about A.D. 1650 to 1820.
Pantaleo 2006	0.5 acre oceanfront parcel located west of the current project area	Archaeological Assessment with Subsurface Testing	No archaeological features identified.
McGerty and Spear 2008	Kawela Bridge Replacement Project located east of the current project area	Archaeological Inventory Survey	Identified one site, SIHP #-2478 - three agricultural terraces. Also identified two previously documented sites, SIHP #-139- Paliku Battlefield, and SIHP #-144- burial sand dune associated with battlefield.
Pacheco 2013	0.39 acre parcel located west of the current project area	Archaeological Assessment with Subsurface Testing	No archaeological features identified.
O’Claray-Nu et al. 2015	Kawela Bridge Replacement Project located east of the current project area	Archaeological Monitoring	No archaeological features identified.

5.0 METHODS

The archaeological assessment was undertaken between August 9th and 11th, 2016. The project was under the overall supervision of Principal Investigator Paul L. Cleghorn, Ph.D. Pacific Legacy archaeologists Caleb Fechner, B.A. and James McIntosh, B.A. conducted the field investigations.

A 100 percent pedestrian survey was conducted with spacing between archaeologists of approximately 5 to 10 m apart depending on vegetation density and ground visibility; most of the survey work was done at 10 m intervals because the relatively light vegetation did not pose an impediment. Transects were roughly oriented West to East with each of the project areas covered in one transect pass. Special attention was given in the Makakupa‘ia Stream drainage where traditional Hawaiian features were anticipated.

Eight backhoe trenches were excavated during the course of the project using a Case hop-toe backhoe equipped with a 2' wide bucket. Trenches ranged in size from approximately 6.0 to 7 m in length by 0.65 to 1.2 m in width by 1.09 to 1.59 m in depth. The placement of each trench was determined in the field with the intent to provide an even distribution across the parcel.

Each trench was closely monitored during excavation. Excavated material was inspected as it was removed from the trenches and emptied from the backhoe bucket. After excavation, the walls of each trench were cleaned and straightened using a flat nose shovel and trowel in order to clearly distinguish the stratigraphy of the soils. The stratigraphy was recorded for each trench with profiles drawn of at least one sidewall. Standard metric measurements were used in all aspects of recording. All soils were recorded using standard United States Department of Agriculture (U.S.D.A.) nomenclature (1951) and Munsell Soil Color Chart designations (2000). Photographs of the project area, work in progress, and trench wall profiles were also taken. The photo scale in all of the profile photographs measures 50 cm in length. The location of each trench was recorded with a Trimble GPS unit and processed through ESRI software. Trenches were backfilled after documentation was complete.

6.0 FIELD INVESTIGATIONS

The AA was conducted within two areas totaling approximately 3.3 acres (143,748 square feet) located along Kamehameha V Highway between mile marker 3.85 and mile marker 4.16 in the *ahupua'a* of Kawela. Fieldwork was completed between 9 August 2016 and 11 August 2016.

The surface survey was conducted on the morning of 9 August 2016. The entire project area was surveyed and no surface archaeological resources or cultural deposits were identified. One historic property, the Makakupa'ia Bridge, has been identified and described in Section 7.0 below.

Eight backhoe test trenches were excavated during the course of the project (Figure 8). No historic or traditional cultural material, subsurface archaeological features, or human remains were encountered in any of the excavation trenches. A limited amount of modern trash debris was encountered on the surface of Trench 1. Given that no historic properties were identified in the project area, these investigations are deemed an archaeological assessment.

In general, the depositional sequence of the current project area consisted of very dusky red loam overlying dark reddish-brown loamy sand that formed in recent alluvium, although the substratum of Trenches 4-7 consisted more of a dark reddish-brown clay loam and clay. All of the soils encountered during test excavations appeared to have been naturally deposited, and no imported fill material was observed. The water table was encountered between approximately 1.02 to 1.32 m below ground surface in four of the eight test trenches, all of which were located in the temporary bypass road APE (Trench 1, 2, 4, and 8). The water table was not encountered in the staging area portion of the APE.

The results of each excavation trench are presented on the following pages after Figure 8.



Figure 8. Aerial image showing project locations with locations of test trenches. (Source: ESRI 2016 and GIS User Community).

6.1 TRENCH 1

Trench 1 was located within the northwestern portion of the Makakupa‘ia Bridge reroute project area situated on the north side of Kamehameha V Highway and west of Makakupa‘ia Stream (Figure 8). The trench was oriented north to south (0-180 degrees, hereafter °) and measured ca. 6.5 m long by 0.8-1.2 m wide. The trench was excavated to a depth of 1.24 m below surface. Several *kiaawe* tree stumps were present on the surface. Three layers were observed during the excavation of Trench 1. Layer I consisted of a natural loam layer that contained a variety of modern trash debris on the surface and tree roots throughout the layer. Layers II and III consisted of natural loamy sand layers that contained no cultural material. The water table was encountered within Layer III at ca. 1.2 m below surface. No subsurface features or cultural materials (other than modern trash debris) were observed during excavation. A profile of the west trench wall was illustrated and after documentation of the subsurface stratigraphy was complete (Figure 9 and Figure 10), the trench was backfilled.

Soil Description - (West Wall Profile)

I	0-70 cmbs	Very dusky red (2.5YR 2.5/2) loam; moderate, fine, crumb; very friable, slightly sticky, slightly plastic; abrupt, smooth boundary. Modern trash debris on surface. Roots throughout layer. Natural.
II	62-98 cmbs	Very dark brown (10YR 2/2) loamy sand; weak, fine, granular; very friable, nonsticky, nonplastic; abrupt, smooth boundary. No cultural material observed. Natural.
III	90-124 cmbs	Dark brown (7.5YR 3/2) loamy sand; weak, fine, granular; very friable, nonsticky, nonplastic. Water table encountered at 120 cmbs. No cultural material observed; natural. The color of this layer in Figure 10 makes this deposit look gleyed, it is possible a portion of the Layer III is partially gleyed due to a fluctuating intertidal water level in this area.

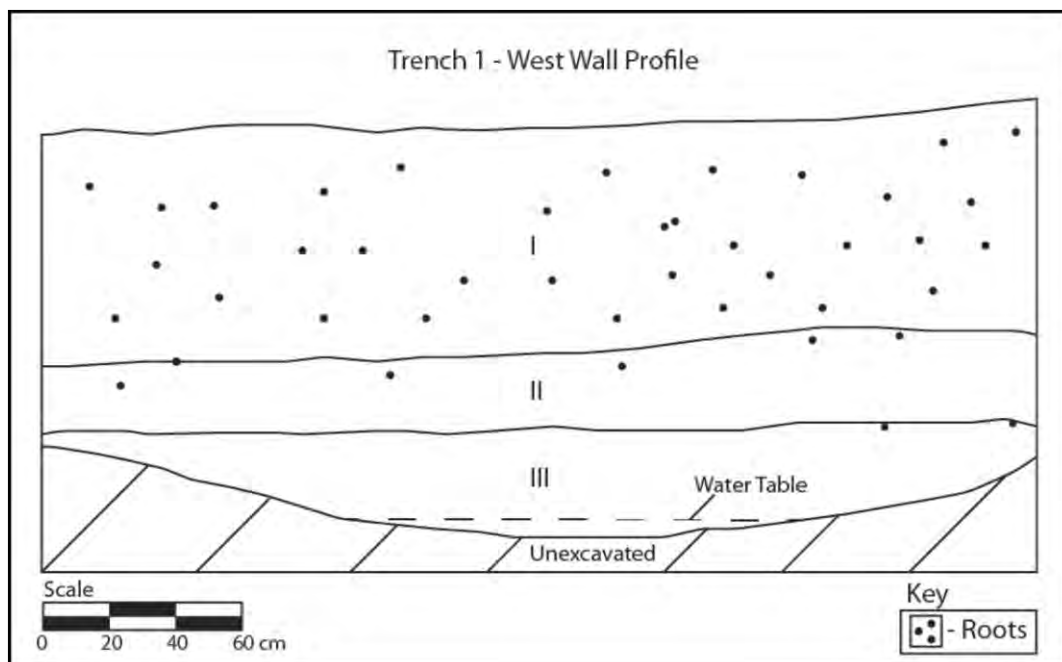


Figure 9. Trench 1, West Wall Profile.

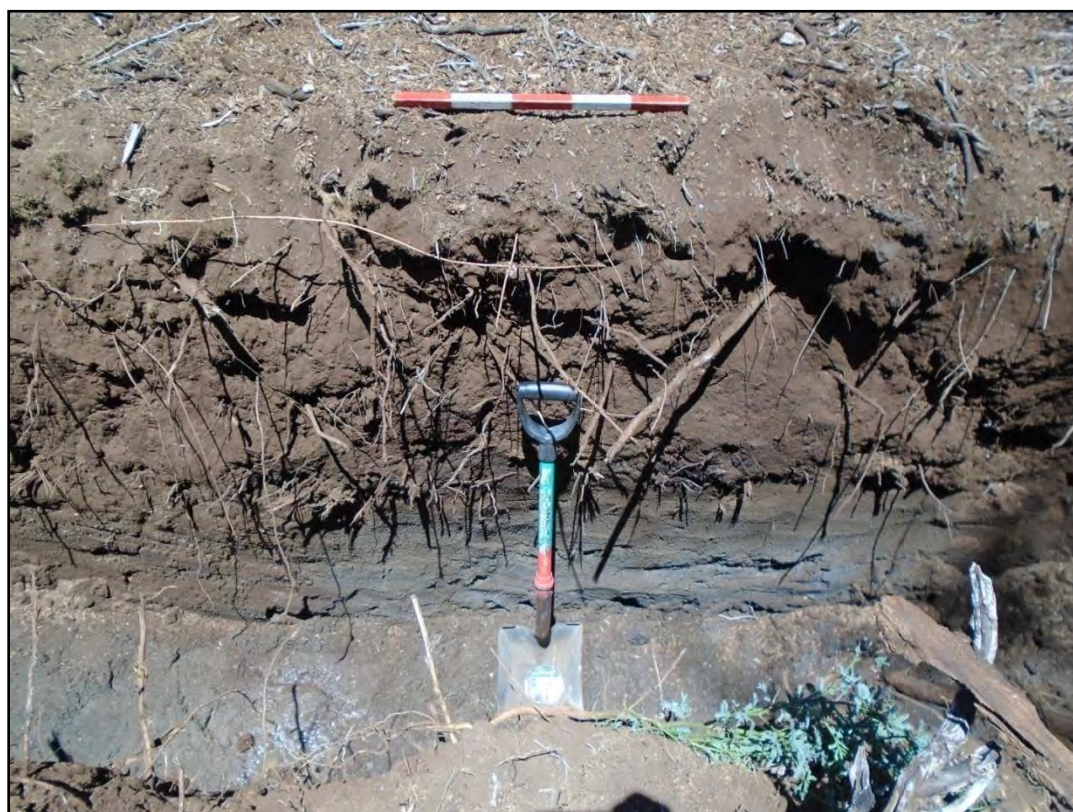


Figure 10. Trench 1, West Wall Profile (view west; scale bar = 50 cm long).

6.2 TRENCH 2

Trench 2 was located within the northwestern portion of the Makakupa‘ia Bridge reroute project area situated on the north side of Kamehameha V Highway and west of Makakupa‘ia Stream (Figure 8). The trench was oriented east to west at (90-270°) and measured ca. 6.5 m long by 0.7 m wide. The trench was excavated to a depth of 1.42 m below surface. Several *kiawe* tree stumps were present on the surface. Three layers were observed during the excavation of Trench 2. Layer I consisted of a natural loam layer that contained a number of roots and no cultural material. Layers II and III consisted of natural loamy sand layers that contained no cultural material. The water table was encountered within Layer III at ca. 1.29 m below surface. No subsurface features or cultural materials were observed during excavation. A profile of the south trench wall was illustrated and after documentation of the subsurface stratigraphy was complete (Figure 11 and Figure 12), the trench was backfilled.

Soil Description - (South Wall Profile)

I	0-76 cmbs	Very dusky red (2.5YR 2.5/2) loam; moderate, fine, crumb; very friable, slightly sticky, slightly plastic; abrupt, smooth boundary. Contained roots. No cultural material observed. Natural.
II	72-102 cmbs	Very dark brown (10YR 2/2) loamy sand; weak, fine, granular; very friable, nonsticky, nonplastic; abrupt, smooth boundary. No cultural material observed. Natural.
III	100-142 cmbs	Dark Brown (7.5YR 3/2) Loamy Sand; weak, fine, granular; very friable, nonsticky, nonplastic. Water table encountered at 129 cmbs. No cultural material observed. Natural.

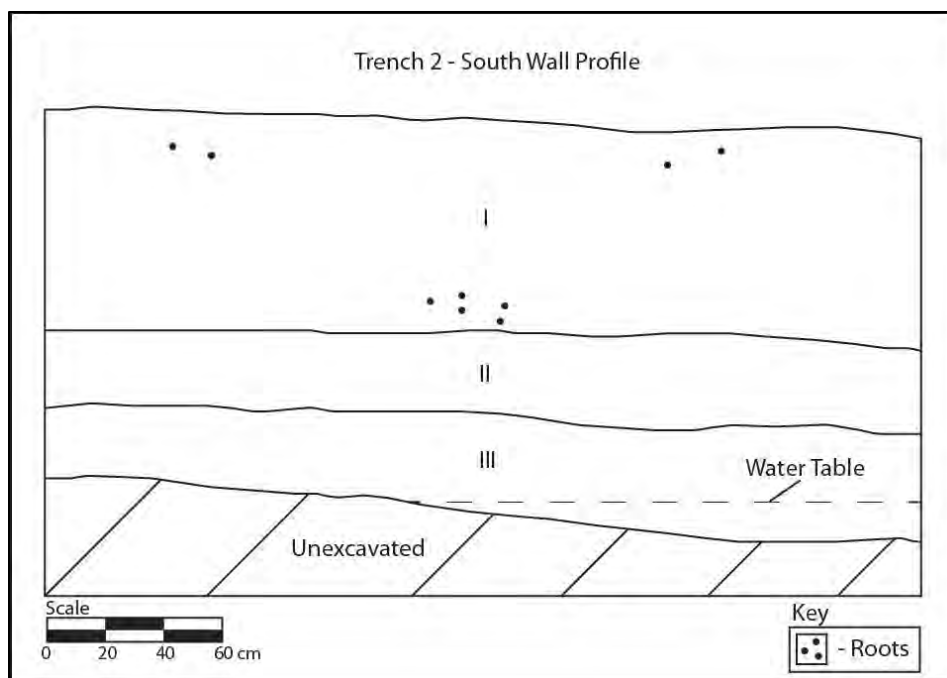


Figure 11. Trench 2, South Wall Profile.



Figure 12. Trench 2, South Wall Profile (view south; scale bar = 50 cm long).

6.3 TRENCH 3

Trench 3 was located within the northwestern portion of the Makakupa‘ia Bridge reroute project area situated on the north side of Kamehameha V Highway and west of Makakupa‘ia Stream (Figure 8). The trench was oriented north to south (0-180°) and measured ca. 7 m long by 0.7-0.8 m wide and was excavated to a depth of 1.59 m below surface. Four layers were observed during the excavation of Trench 3. Layer I consisted of a natural loam layer containing roots and no cultural material. Layer II consisted of a natural clay loam layer containing roots and no cultural material. Layer III consisted of a natural sandy clay loam containing roots and no cultural material. Layer IV consisted of a natural loamy sand layer that contained no cultural material. No water table was encountered in Trench 3. No subsurface features or cultural materials were observed during excavation. A profile of the east trench wall was illustrated and after documentation of the subsurface stratigraphy was complete (Figure 13 and Figure 14), the trench was backfilled.

Soil Description - (East Wall Profile)

I	0-65 cmbs	Very dusky red (2.5YR 2.5/2) loam; moderate, fine, crumb; very friable, slightly sticky, slightly plastic; abrupt, smooth boundary. Contained roots. No cultural material observed. Natural.
II	59-90 cmbs	Very dark brown (7.5 YR 2.5/2) clay loam; moderate, medium, crumb; very friable, slightly sticky, plastic; abrupt, smooth boundary. Contained roots. No cultural material observed. Natural.
III	84-136 cmbs	Dark reddish brown (2.5YR 3/3) sandy clay loam; weak, fine, granular; very friable, slightly sticky, slightly plastic; abrupt, smooth boundary. Contained roots. No cultural material observed. Natural.
IV	122-159 cmbs	Dark reddish brown (5YR 2.5/2) loamy sand; weak, fine, granular; very friable, nonsticky, nonplastic. No cultural material observed. Natural.

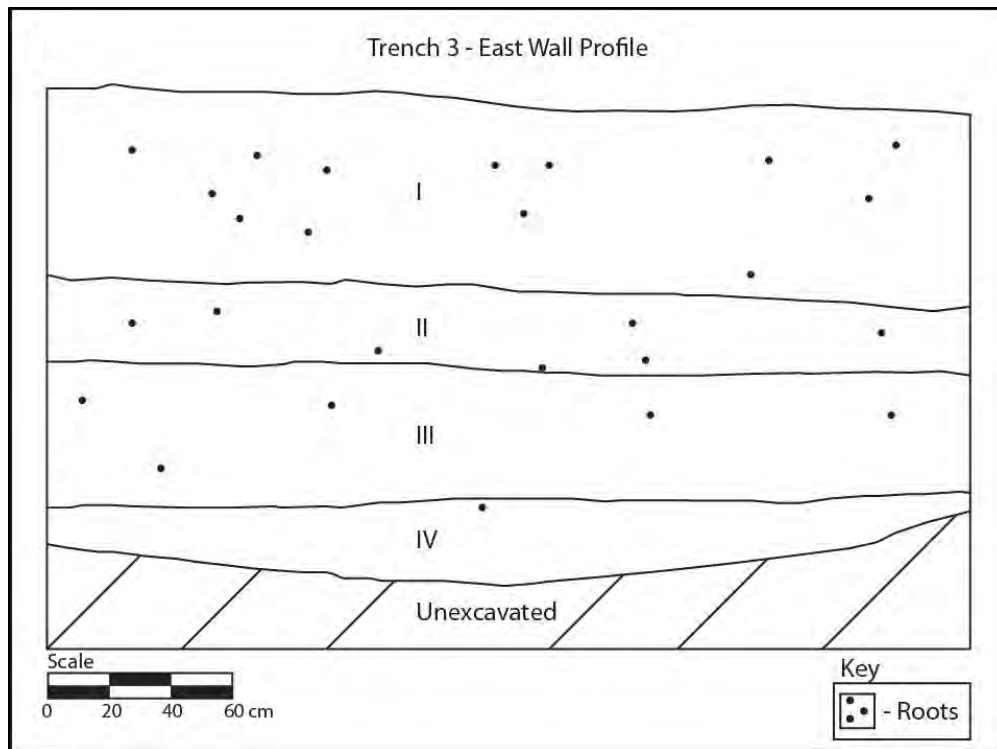


Figure 13. Trench 3, East Wall Profile.



Figure 14. Trench 3, East Wall Profile (view east; scale bar = 50 cm long).

6.4 TRENCH 4

Trench 4 was located within the central portion of the Makakupa‘ia Bridge reroute project area situated on the north side of Kamehameha V Highway and east of Makakupa‘ia Stream (Figure 8). The trench was oriented east to west (90-270°) and measured ca. 6 m long by 0.7 m wide and was excavated to a depth of 1.37 meters. Three layers were observed during the excavation of Trench 4. Layers I, II, and III consisted of natural clay loam layers that contained no cultural material. Layers I contained a number of roots, and Layer II contained a single basalt cobble. The water table was encountered within Layer III at ca. 1.32 m below the surface. No subsurface features or cultural materials were observed during excavation. A profile of the north trench wall was illustrated and after documentation of the subsurface stratigraphy was complete (Figure 15 and Figure 16), the trench was backfilled.

Soil Description - (North Wall Profile)

I	0-78 cmbs	Dark reddish brown (5YR 2.5/2) clay loam; moderate, medium, crumb; very friable, sticky, plastic; abrupt, smooth boundary. Contained roots. No cultural material observed. Natural.
II	68-118 cmbs	Very dark brown (7.5YR 2.5/2) clay loam; moderate, medium, angular blocky; very friable, very sticky, very plastic; abrupt, smooth boundary. Contained a single basalt cobble. No cultural material observed. Natural.
III	108-137 cmbs	Very dark brown (10YR 2/2) clay loam; moderate, medium, angular blocky; very friable, very sticky, very plastic. Water table encountered at 132 cmbs. No cultural material observed. Natural.

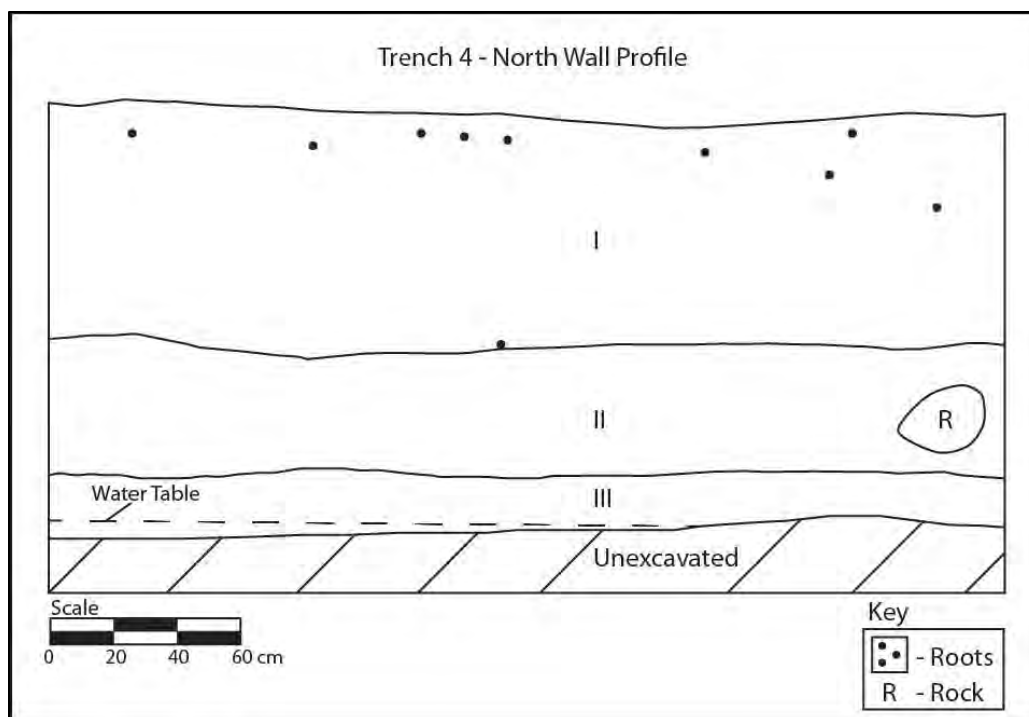


Figure 15. Trench 4, North Wall Profile.



Figure 16. Trench 4, North Wall Profile (view north; scale bar = 50 cm long).

6.5 TRENCH 5

Trench 5 was located within the northeastern portion of the Makakupa‘ia Bridge reroute project area situated on the north side of Kamehameha V Highway and east of Makakupa‘ia Stream (Figure 8). The trench was oriented north to south (0-180°) and measured ca. 6 m long by 0.75-1 m wide and was excavated to a depth of 1.42 m below surface. Five layers were observed during the excavation of Trench 5. Layer I consisted of a natural loam layer that contained a number of roots and no cultural material. Layer II consisted of a natural clay loam layer that contained charcoal flecking, but no chunks of charcoal and no cultural material was observed. Layer III consisted of a natural clay layer that contained no cultural material. Layer IV consisted of a natural clay loam layer that contained no cultural material. Layer V consisted of a natural sandy loam layer that contained no cultural material. No water table was encountered in Trench 5. No subsurface features or cultural materials were observed during excavation. A profile of the west trench wall was illustrated and after documentation of the subsurface stratigraphy was complete (Figure 17 and Figure 18), the trench was backfilled.

Soil Description - (West Wall Profile)

I	0-70 cmbs	Very dusky red (2.5YR 2.5/2) loam; moderate, fine, crumb; very friable, slightly sticky, slightly plastic; abrupt, smooth boundary. Contained roots. No cultural material observed. Natural.
II	68-77 cmbs	Black (5YR 2.5/1) clay loam; moderate, medium, crumb; very friable, sticky, plastic; abrupt, smooth boundary. Contained charcoal flecking. No cultural material observed. Natural.
III	75-118 cmbs	Very dark brown (7.5YR 2.5/2) clay; moderate, medium, angular blocky; very friable, sticky, plastic; abrupt, smooth boundary. No cultural material observed. Natural.
IV	108-128 cmbs	Dark reddish brown (5YR 3/3) clay loam; moderate, medium, crumb; very friable, sticky, plastic; abrupt, smooth boundary. No cultural material observed. Natural.
V	121-142 cmbs	Dark reddish brown (5YR 2.5/2) sandy loam; weak, fine, granular; very friable, nonsticky, nonplastic. No cultural material observed. Natural.

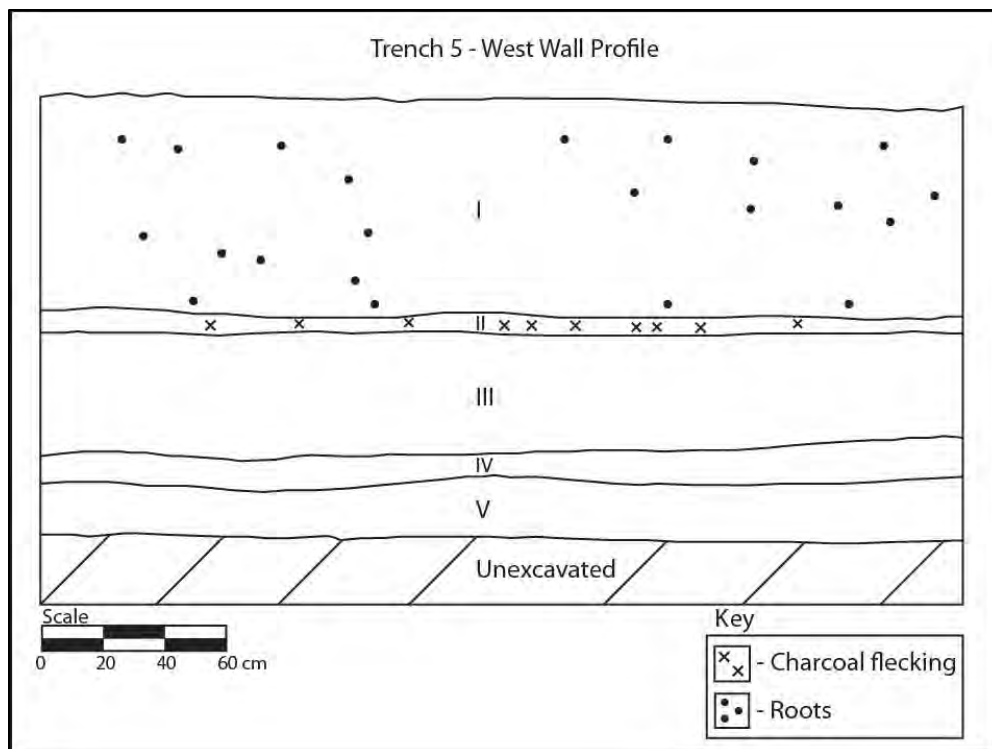


Figure 17. Trench 5, West Wall Profile.

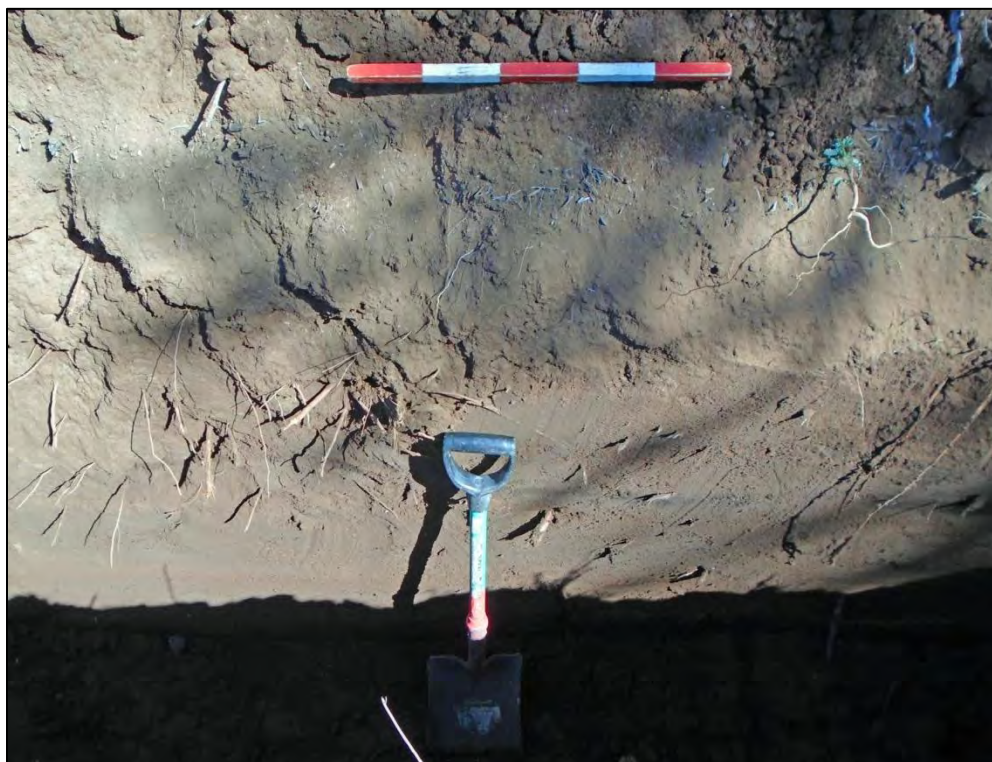


Figure 18. Trench 5, West Wall Profile (view west; scale bar = 50 cm long).

6.6 TRENCH 6

Trench 6 was located within the western portion of the Makakupa‘ia Bridge lay down project area situated on the north side of Kamehameha V Highway and west of Makakupa‘ia Stream (Figure 8). The trench was oriented north to south (0-180°) and measured ca. 7 m long by 0.8-0.9 m wide and was excavated to a depth of 1.46 m below surface. Three layers were observed during the excavation of Trench 6. Layer I consisted of a natural mottled loam layer that contained roots and no cultural material. Layer II consisted of a natural clay loam layer that contained no cultural material. Layer III consisted of a natural mottled clay layer that contained no cultural material. No water table was encountered in Trench 5. No subsurface features or cultural materials were observed during excavation. A profile of the west trench wall was illustrated and after documentation of the subsurface stratigraphy was complete (Figure 19 and Figure 20), the trench was backfilled.

Soil Description - (West Wall Profile)

I	0-90 cmbs	Very dusky red (2.5YR 2.5/2) loam; moderate, fine, crumb; very friable, slightly sticky, slightly plastic; abrupt, smooth boundary. Partially mottled. Contained roots. No cultural material observed. Natural.
II	84-128 cmbs	Dark reddish brown (5YR 2.5/2) clay loam; moderate, medium, angular blocky; friable, slightly sticky, plastic; abrupt, smooth boundary. No cultural material observed. Natural.
III	125-146 cmbs	Dark reddish brown (5YR 3/3) clay; moderate, medium, angular blocky; very friable, very sticky, very plastic. Partially mottled. No cultural material observed. Natural.

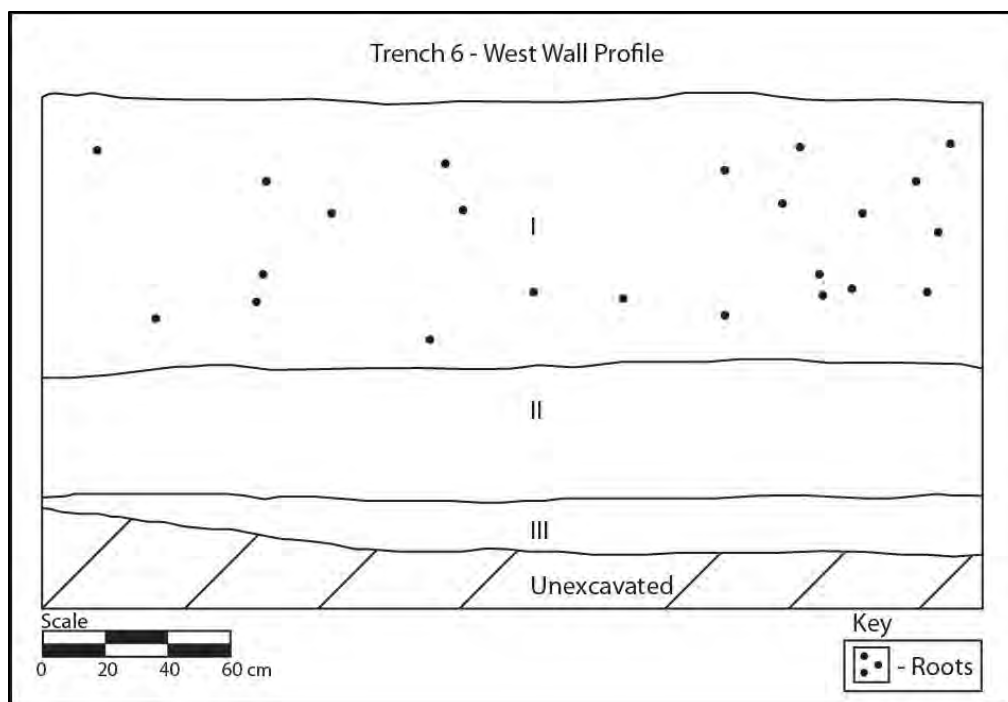


Figure 19. Trench 6, West Wall Profile.

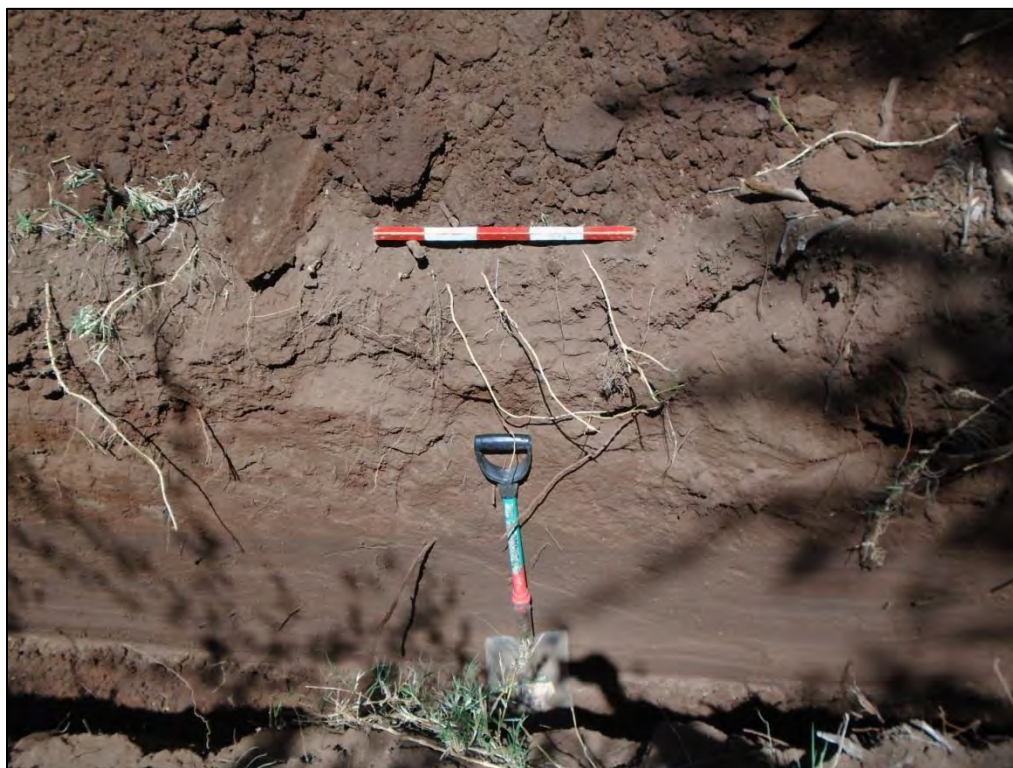


Figure 20. Trench 6, West Wall Profile (view west; scale bar = 50 cm long).

6.7 TRENCH 7

Trench 7 was located within the western portion of the Makakupa‘ia Bridge lay down project area situated on the north side of Kamehameha V Highway and west of Makakupa‘ia Stream (Figure 8). The trench was oriented north to south (0-180°) and measured ca. 7 m long by 0.7-0.9 m wide and was excavated to a depth of 1.42 m below surface. Five layers were observed during the excavation of Trench 7. Layer I consisted of a natural loam layer that contained roots and no cultural material. Layer II consisted of a natural clay loam layer that contained charcoal flecking, but no chunks of charcoal and no cultural material was observed. Layer III consisted of a natural clay loam layer containing no cultural material. Layer IV consisted of a natural clay layer containing no cultural material. Layer V consisted of a natural clay loam layer containing no cultural material. No water table was encountered in Trench 7. No subsurface features or cultural materials were observed during excavation. A profile of the west trench wall was illustrated and after documentation of the subsurface stratigraphy was complete (Figure 21 and Figure 22), the trench was backfilled.

Soil Description - (West Wall Profile)

I	0-58 cmbs	Very dusky red (2.5YR 2.5/2) loam; moderate, fine, crumb; very friable, slightly sticky, slightly plastic; abrupt, smooth boundary. Contained roots. No cultural material observed. Natural.
II	50-65 cmbs	Black (5YR 2.5/1) clay loam; moderate, medium, crumb; very friable, sticky, plastic; abrupt, smooth boundary. Contained charcoal flecking. No cultural material observed. Natural.
III	57-97 cmbs	Dark reddish brown (5YR 3/3) clay loam; weak, medium, crumb; very friable, slightly sticky, plastic; abrupt, smooth boundary. No cultural material observed. Natural.
IV	90-120 cmbs	Dark reddish brown (5YR 3/3) clay; moderate, medium, angular blocky; very friable, very sticky, very plastic; abrupt, smooth boundary. No cultural material observed. Natural.
V	114-142 cmbs	Dark reddish brown (5YR 2.5/2) clay loam; moderate, fine, crumb; very friable, nonsticky, slightly plastic. No cultural material observed. Natural.

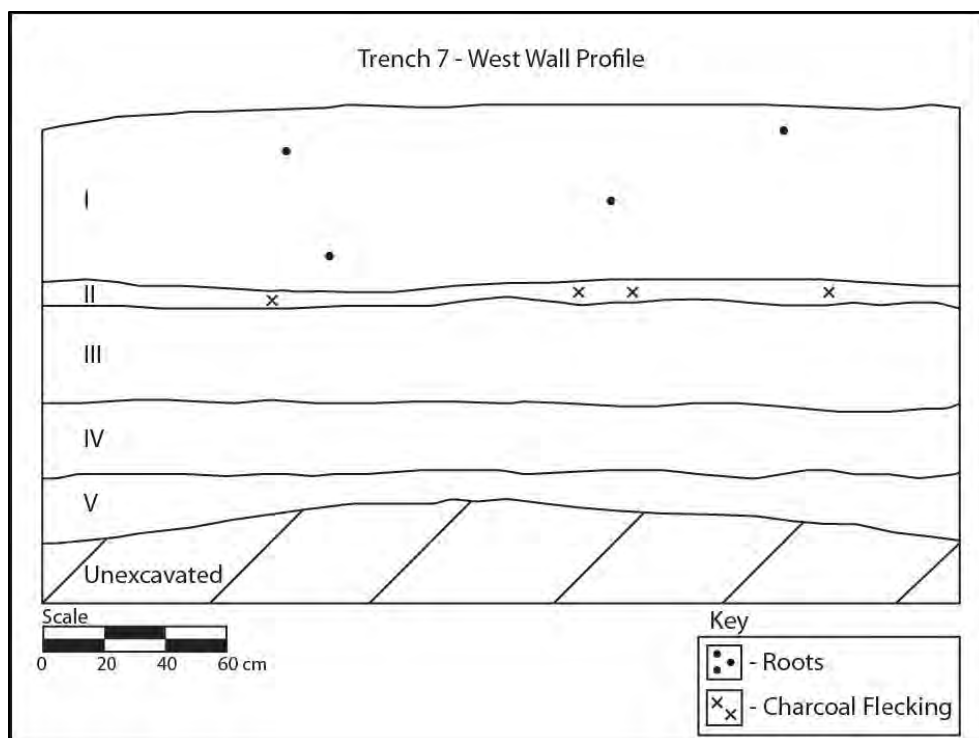


Figure 21. Trench 7, West Wall Profile.



Figure 22. Trench 7, West Wall Profile (view west; scale bar = 50 cm long).

6.8 TRENCH 8

Trench 8 was located within the northwestern portion of the Makakupa‘ia Bridge reroute project area situated on the north side of Kamehameha V Highway and west of Makakupa‘ia Stream (Figure 8). The trench was oriented east to west (90-270°) and measured ca. 6.5 m long by 0.65-0.90 m wide and was excavated to a depth of 1.09 m below surface. Four layers were observed during the excavation of Trench 8. Layer I consisted of a natural loam layer containing no cultural material. Layer II consisted of a natural clay loam layer that contained basalt cobbles near the base of the layer and no cultural material. Layer III consisted of a natural sand layer that also contained basalt cobbles near the top of the layer and no cultural material. Layer IV consisted of a natural loamy sand layer containing no cultural material. The water table was encountered within Layer IV at ca. 1.02 m below surface. No subsurface features or cultural materials were observed during excavation. A profile of the north trench wall was illustrated and after documentation of the subsurface stratigraphy was complete (Figure 23 and Figure 24), the trench was backfilled.

Soil Description - (North Wall Profile)

I	0-36 cmbs	Very dusky red (2.5YR 2.5/2) loam; moderate, fine, crumb; very friable, slightly sticky, slightly plastic; abrupt, smooth boundary. No cultural material observed. Natural.
II	25-94 cmbs	Dark reddish brown (5YR 3/3) clay loam; moderate, medium, angular blocky; very friable, slightly sticky, plastic; abrupt, smooth boundary. Contained basalt cobbles near base of layer. No cultural material observed. Natural.
III	88-99 cmbs	Yellowish brown (10YR 5/4) sand; structureless; medium, single grain; loose, noncoherent, nonsticky, nonplastic; abrupt, smooth boundary. Contained basalt cobbles near top of layer. No cultural material observed; natural. The color of this layer in Figure 24 makes this deposit look gleyed, it is possible a portion of the Layer III is partially gleyed due to a fluctuating intertidal water level in this area.
IV	96-109 cmbs	Brown (10YR 5/3) loamy sand; weak, fine, granular; very friable, nonsticky, nonplastic. Water table encountered at 102 cmbs. No cultural material observed. Natural.

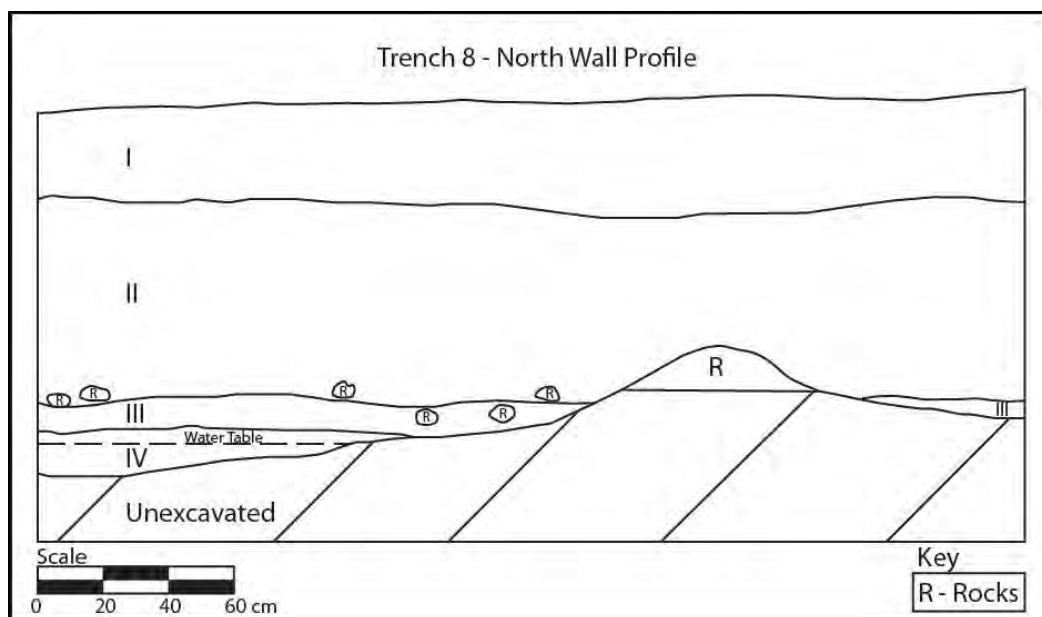


Figure 23. Trench 8, North Wall Profile.



Figure 24. Trench 8, North Wall Profile (view north; scale bar = 50 cm long).

7.0 MAKAKUPA‘IA BRIDGE

The Makakupa‘ia Bridge is located along the Kamehameha V Highway and crosses an unnamed stream. The bridge was originally constructed in 1940 and is identified as Bridge No. 009004500500394. The Hawaii State Historic Bridge Inventory and Evaluation conducted in 2013 (MKE Associates LLC, Fung Associates, Inc. 2013) provides an excellent description of the bridge and its construction methods.

The Makakupaia Bridge carries Kamehameha V Highway across Makakupaia Stream. Located on the island of Molokai, the Makakupaia Bridge is a single-span reinforced concrete, flat slab bridge in its original location, is generally in good condition, and its materials remain intact. The form work is evident on its solid concrete parapets and the bridge has CRM abutments. Metal thrie beams are integrated to the approaches of the parapets however, workmanship of the bridge has not been obscured by additions or repairs (MKE Associates LLC, Fung Associates, Inc. 2013: 5-116).

Further documentation of Makakupa‘ia Bridge can be found in the Makakupa‘ia Bridge State Historic Inventory Form (Appendix D) and the Routine Bridge Inspection Report (Makakupa‘ia Bridge: Bridge No. 009004500500394) which was conducted in January 2010 (Nagamine Okawa Engineers Inc.) for the State of Hawai‘i (Appendix E). As-built drawing of the bridge prepared in 1938 is presented in Appendix E. These documents provide technical drawings, schematics, and photographs of the Makakupa‘ia Bridge.

The Hawaii State Historic Bridge Inventory and Evaluation report (MKE Associates LLC, Fung Associates, Inc. 2013) makes the determination that the Makakupa‘ia Bridge is eligible for listing on both the National Register of Historic Places (NRHP) and the Hawaii Register of Historic Places (HRHP) (Jessica Puff, pers. comm. 9 March 2017). The significance statement supporting this determination reads:

This bridge is eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. It is a good example of the 1940s reinforced concrete flat slab bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design. (MKE Associates LLC, Fung Associates, Inc. 2013: 5-117).

This report also notes that at the time of the report writing, the bridge was in a consultation process for replacement. (MKE Associates LLC, Fung Associates, Inc. 2013: 5-115; see Appendix D). Regrettably, documentation of these consultations has not been located.

As a part of conducting research on this bridge, brief informal consultations were undertaken with Susan Lebo and Jessica Puff at the SHPD. It is their opinion that the Makakupa‘ia Bridge is to be considered a historic property because it has been determined eligible for listing on both the NRHP and the HRHP. As such, effect determinations and mitigation measures need to be recommended as part of the current AA. These recommendations are made in Section 8.1.



Figure 25. Makakupa'ia Bridge in 2010 (view to the North [*mauka*] from Nagamine Okata Engineers 2010: PHOTO 20)



Figure 26. Makakupa'ia Bridge in 2010 (view to the South [*makai*] from Nagamine Okata Engineers 2010: PHOTO 19)

8.0 SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Pacific Legacy Inc., at the request of EKNA Services, Inc. on behalf of HDOT, conducted AA investigations (surface survey and subsurface excavation) for the proposed bridge replacement of the Makakupa‘ia Bridge. This project is being conducted under the auspices of the FHWA and HDOT and is considered an “undertaking” under Section 106 of the National Historic Preservation Act (36 CFR Part 800). All methods and procedures governing an Archaeological Inventory Survey were followed (cf. HAR §13-276), however since no archaeological findings were made, this report is being issued as an Archaeological Assessment as per HAR § 13-275.5).

The proposed project consists of replacing the existing Makakupa‘ia Bridge. Construction tasks include: construct temporary bypass road, demolish existing bridge (leaving the existing abutments in place), and then construct new Makakupa‘ia Bridge, relocate utilities, construct highway transition to the new bridge, and install new pavement signing, striping and markings.

The Makakupa‘ia Bridge was constructed in 1940 to span an unknown stream located along the Kamehameha V Highway. The Hawaii State Historic Bridge Inventory and Evaluation conducted in 2013 (MKE Associates LLC, Fung Associates, Inc. 2013) determined that the bridge is eligible for listing on both the HRHP and the HRHP and is thus considered a historic property. The 2013 report notes that the bridge was being considered for replacement and that consultations were taking place regarding this replacement. (MKE Associates LLC, Fung Associates, Inc. 2013: 5-115).

A 100% archaeological surface survey was conducted for the current investigation and did not identify any archaeological sites or other cultural resources. Much of the APE has been disturbed by improvements or regular maintenance associated with the highway easement.

Subsurface backhoe testing was also undertaken. Eight backhoe trenches were excavated within the project APE. No subsurface cultural resources were uncovered.

8.1 EFFECT DETERMINATION AND MITIGATION RECOMMENDATIONS

The investigations did not identify any archaeological resources such as traditional masonry structures (e.g., walls and platforms), subsurface cultural deposits, or early historic features such as cattle walls, water features etc. Thus, there will be no effect to any traditional or early post -Contact historic properties.

The Makakupa‘ia Bridge is considered a historic property and is scheduled for replacement. This project is being conducted under the auspices of the FHWA and is thus considered an undertaking as defined in the National Historic Preservation Act of 1966, as amended. This undertaking will consist of demolition of the existing bridge and construction of a replacement. The demolition of the Makakupa‘ia Bridge will have an “adverse effect” on this historic property. The Makakupa‘ia Bridge has had considerable modifications since its construction in

1940 that have somewhat compromised the integrity of the bridge. The integral features of the bridge and the modifications to the bridge have been well documented with written descriptions, photographs, and scaled drawings (see Appendix D and Appendix E). These documents have mitigated the "adverse effect" that the project will have on this historic property. No further documentation of this bridge is recommended.

Because of the lack of any traditional or early historic cultural resources being identified within the APE and the very low potential to encounter any cultural resources, no archaeological monitoring is recommended for the proposed construction associated with the bridge replacement. However, in the unlikely event that potentially significant cultural resources, including human skeletal remains, are encountered during construction, work in the immediate area of the finding must halt and the SHPD Maui archaeologist must be notified (Barker Fariss [808-246-4626] or Jenney Pickett [808-243-5169]).

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APPENDIX A: HDOT LETTER TO SHPD REGARDING APE DETERMINATION

DAVID Y. IGE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

FORD N. FUCHIGAMI
DIRECTOR


Deputy Director
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
HWY-DB 2.1033

June 3, 2016

TO: THE HONORABLE SUZANNE CASE, CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTN: ALAN S. DOWNER, PH.D.
ADMINISTRATOR AND DEPUTY STATE HISTORIC PRESERVATION OFFICER
STATE HISTORIC PRESERVATION DIVISION

FROM: FORD N. FUCHIGAMI 
DIRECTOR OF TRANSPORTATION

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT (NHPA)
SECTION 106 CONSULTATION
AREA OF POTENTIAL EFFECT (APE) CONCURRENCE
MAKAKUPAIA BRIDGE REPLACEMENT
KAWELA AHUPUAA
KONA DISTRICT
ISLAND OF MOLOKAI
FEDERAL-AID PROJECT NO. BR-0450(10)
TAX MAP KEY(S): (2) 5-4-003 por. and 017 por., (2) 5-4-003:028

On behalf of the Federal Highway Administration (FHWA), the State of Hawaii, Department of Transportation (HDOT) requests the State Historic Preservation Officer's (SHPO) concurrence on the APE, pursuant to Section 106 of the NHPA and Title 36 of the *Code of Federal Regulations*, Section 800.4(a)(1). In a letter dated February 1, 2016, to SHPO, FHWA authorized HDOT to conduct NHPA Section 106 consultation directly with State Historic Preservation Division. FHWA however, remains responsible for all findings and determinations charged to the agency during the Section 106 consultation process.

The proposed project is located in Kawela, Molokai Island, Hawaii. The APE is the area affected by construction activities related to the replacement of Makakupaia Bridge.

The APE includes two areas:

1. The first area is a multi-sided shaped boundary located from approximately milepoint 3.85 to milepoint 4.02 along Kamehameha V Highway. This area includes the HDOT right-of-way (existing bridge and highway approaches) and adjacent property for the temporary bypass road (north of the highway). Total area is approximately 2.8 acres. The parcel on which the temporary bypass road is situated is TMK:(2)5-4-003:028.
2. The second area is a rectangular shaped boundary located from approximately milepoint 4.13 to milepoint 4.16 along Kamehameha V Highway and north of the highway. This area includes the Contractor's staging area (approximately 0.5 acres). This area is located on TMK:(2)5-4-003:028. Please refer to the enclosed APE location map. The total area of the APE is approximately 3.3 acres.

THE HONORABLE SUZANNE CASE
June 3, 2016
Page 2

HWY-DB 2.1033

The project consists of replacing the existing Makakupaia Bridge. Construction tasks include: construct temporary bypass road, demolish existing bridge and construct new Makakupaia Bridge, relocate utilities, construct highway transition to the new bridge, and install new pavement signing, striping and markings.

Pursuant to Section 106 of the NHPA, we request your review and concurrence with this determination of the APE for the proposed project.

Should you have any questions, please contact our Project Manager, Mr. James Fu at (808) 692-7613 of our Bridge Design Section, Design Branch, Highways Division, or by email at james.fu@hawaii.gov.

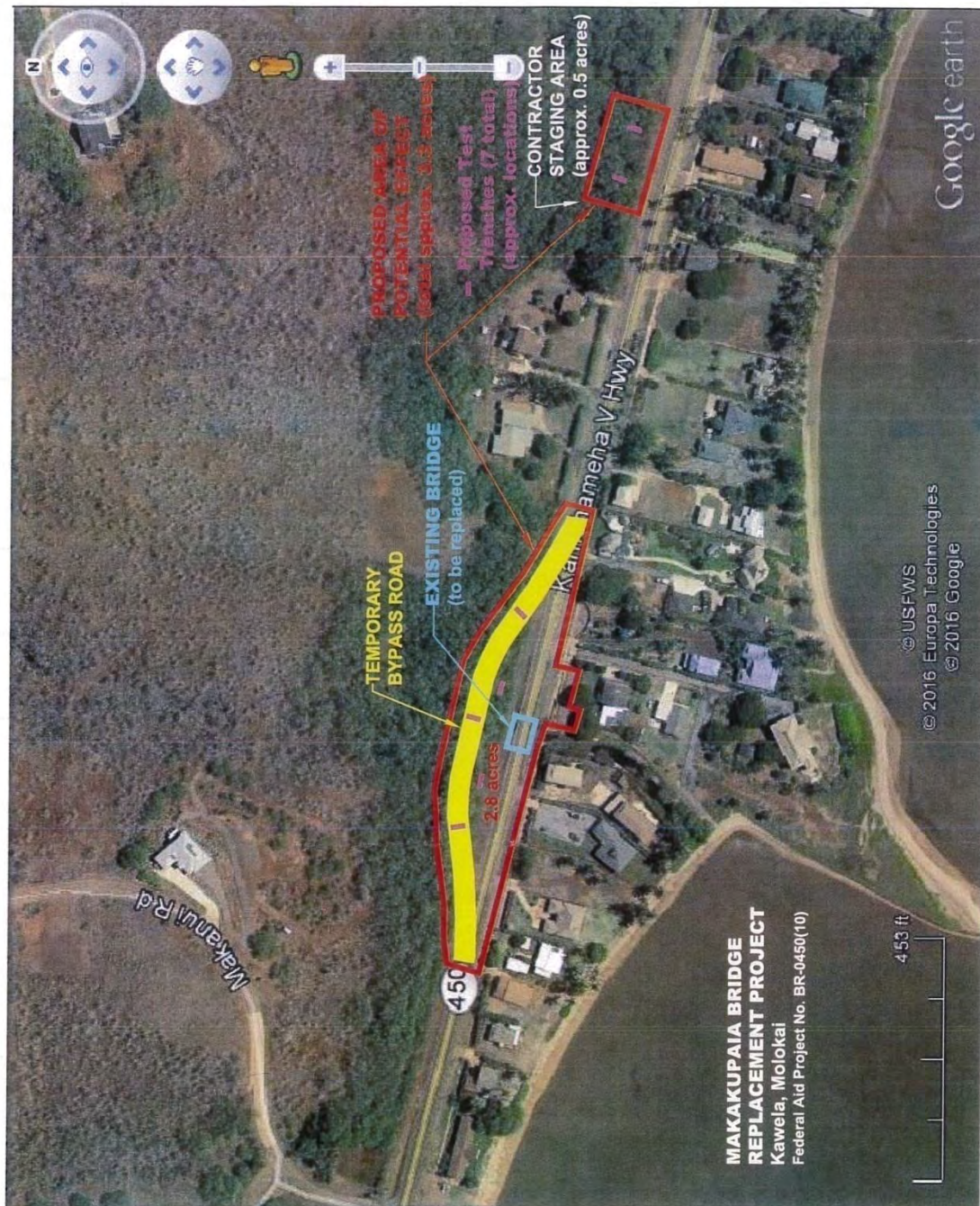
Enclosures:

1. Location Map of Makakupaia Bridge
2. Map of Area of Potential Effect (APE)

JF: jj

c: Ken Santana, Mitsunaga & Associates
Elaine Tamaye, EKNA Services, Inc.
Paul Cleghorn, Pacific Legacy, Inc.

bc: James Fu, HWY-DB
Todd Nishioka, HWY-DE



Enclosure (2)

APPENDIX B: SHPD CONCURRENCE LETTER

DAVID Y. IGE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

June 28, 2016

Ford N. Fuchigami
Director of Transportation
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

IN REPLY REFER TO:
LOG: 2016.01398
DOC: 1606JLP20
Concur w/ APE

RE: National Historic Preservation Act (NHPA) Section 106 Cultural Resources Management Consultation and Hawaii Revised Statutes (HRS) Chapter 6E-8 Historic Preservation Review
Agency: Federal Highways Administration (FHWA)
Project Name: Makakupaia Bridge Replacement project (Federal-Aid Project No. BR-0450(10))
Location: Kawela Ahupuaa, Kona District, Island of Molokai
TMK: (2) 5-4-003 por. and 017 por., (2) 5-4-003:028

Dear Mr. Fuchigami:

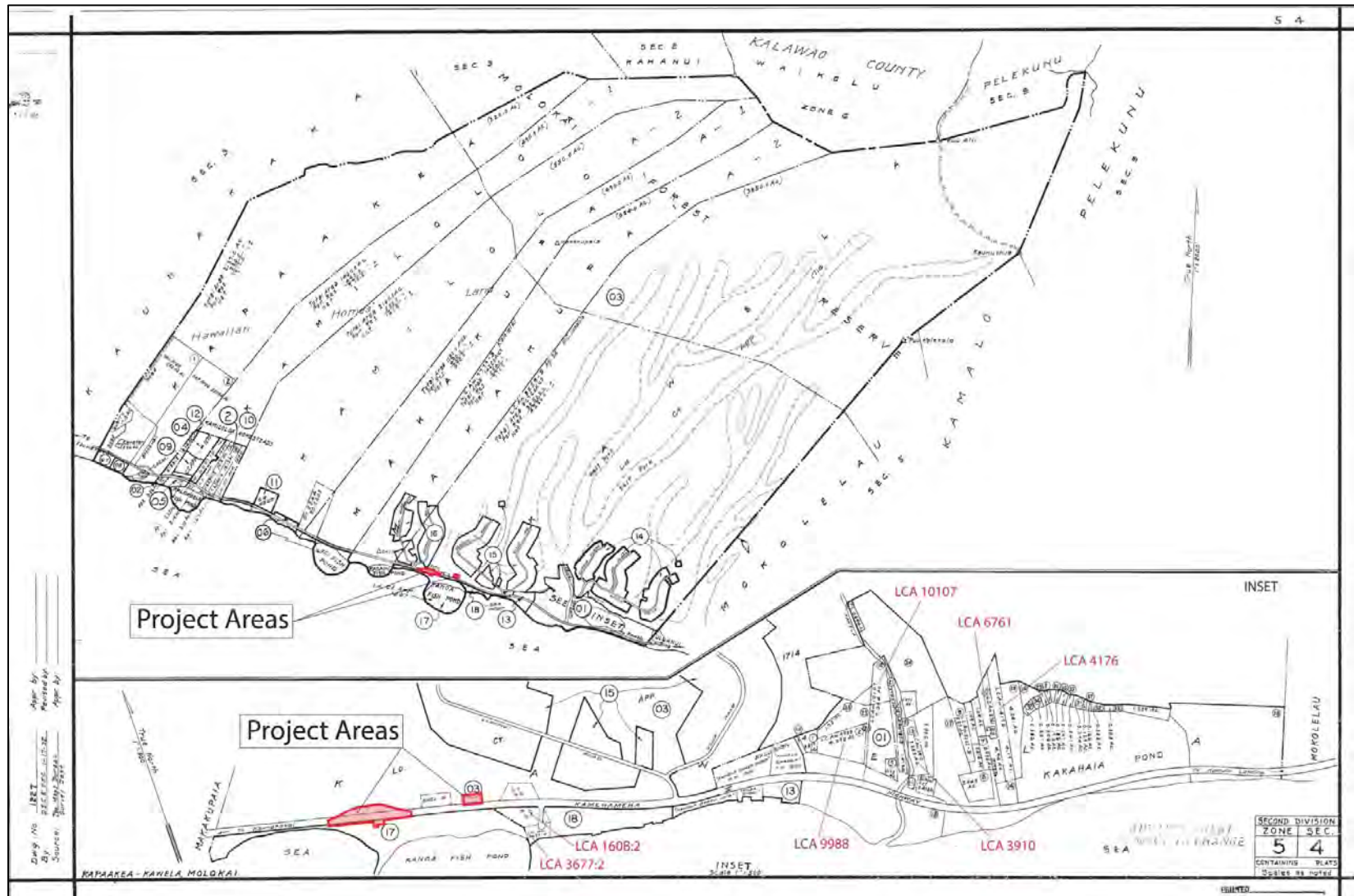
On June 8, 2016, the State Historic Preservation Division (SHPD) received a request for concurrence from the Hawaii Department of Transportation (HDOT) on behalf of the Federal Highways Administration (FHWA) for the Makakupaia Bridge Replacement project Area of Potential Effect (APE) at (2) 5-4-003 por. and 017 por., (2) 5-4-003:028. SHPD has reviewed and concurs with the above cited APE.

SHPD looks forward to future consultation with HDOT and successful completion of the NHPA Section 106 process. Please reference the SHPD LOG number and DOC number in all communication with this office regarding this undertaking.

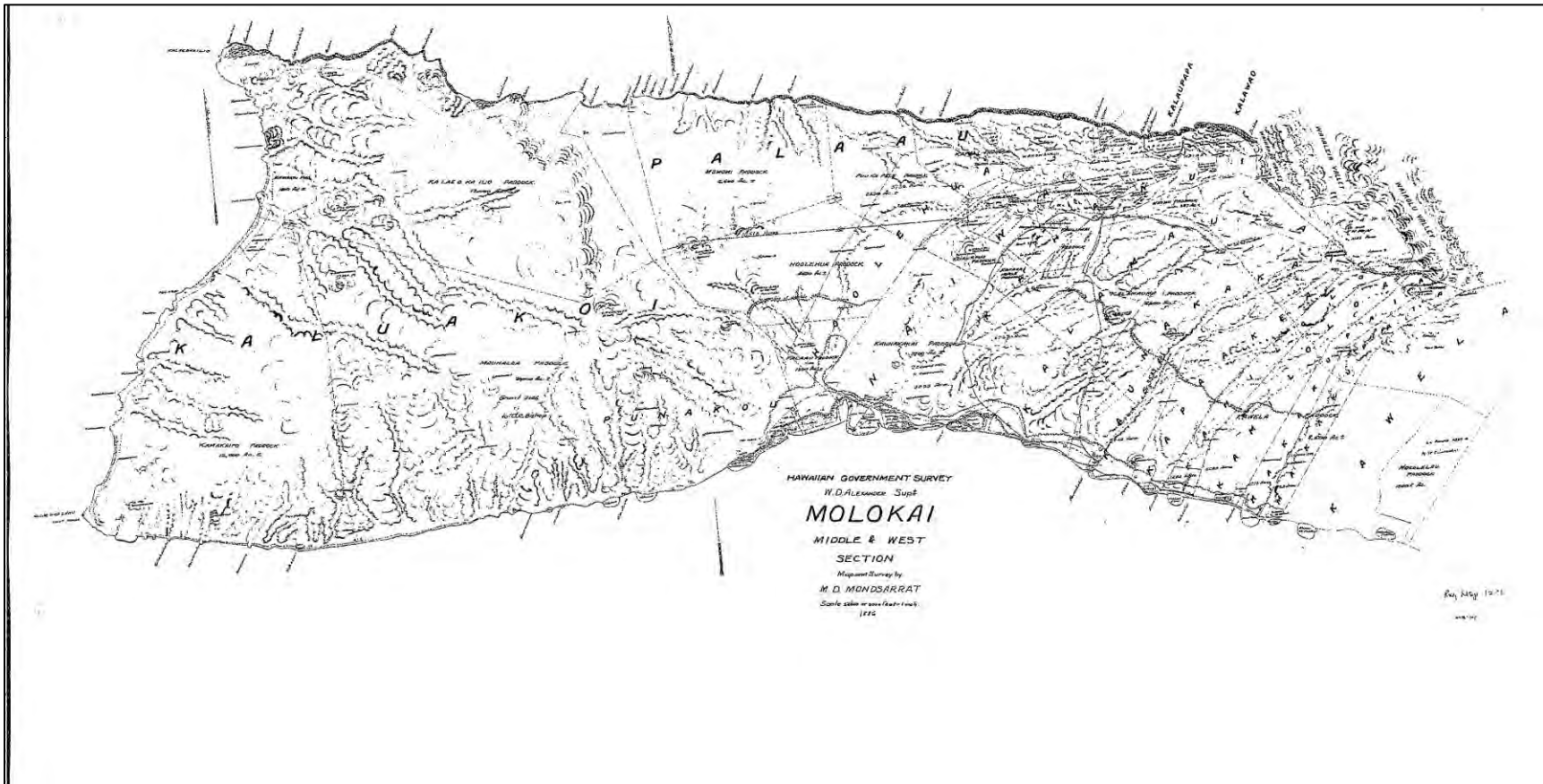
Mahalo,

Dr. Alan Downer
Deputy State Historic Preservation Officer

APPENDIX C: MAPS SHOWING LAND COMMISSION AWARDS



TMK Map showing locations of LCAs in the project vicinity.



1886 map by M. Monsarrat showing location of Wm. Lunalilo's LCA (no. 8559 B) in Kawela

APPENDIX D: MAKAKUPA‘IA BRIDGE STATE HISTORIC INVENTORY FORM
[from the Hawaii State Bridge Inventory and Evaluation Report
(MKK Associates, LLC and Fung Associates, LLC 2013)]

MauI State Bridge Matrix

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/Railing Type	Listed on National/Hawai'i Register	Eligibility Status*	Character Defining Feature (Significance)	Page No.
009003600502546	Kupukoi Stream Bridge	Kupukoi Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	Yes	High Preservation Value	<ul style="list-style-type: none"> Contributes to the Hana Highway Historic Bridge District. Part of best remaining intact example of a belt road system in the state. 20th century example of bridge engineering and construction. Significant for commerce and social history. See National Register of Places Nomination Form in appendices. 	5-109
009003600502779	Lanikele Stream Bridge	Lanikele Stream	Hana Highway	1917	Concrete Tee Beam	Concrete Open Vertical	Yes	High Preservation Value	<ul style="list-style-type: none"> Contributes to the Hana Highway Historic Bridge District. Part of best remaining intact example of a belt road system in the state. 20th century example of bridge engineering and construction. Significant for commerce and social history. See National Register of Places Nomination Form in appendices. 	5-112
009003600301907	Launilupo Stream Bridge	Launilupo Stream	Honoapiilani Highway	1938	Concrete Slab	Concrete Solid	No	Not Eligible	This bridge has lost integrity due to significant road widening in 1990.	n/a
009004500500394	Makakupaia Bridge	Unnamed Stream	Kamehameha V Highway	1940	Concrete Slab	Concrete Solid	No	Eligible	<ul style="list-style-type: none"> Associated with early developments in concrete bridge construction in Hawai'i. Good example of the 1940's reinforced concrete flat slab bridge. Bridge is undergoing consultation process in 2013 for replacement in 2015. 	5-113
009003600500824	Makanani Stream Bridge	Makanani Stream	Hana Highway	1928	Concrete Slab	Concrete Open Vertical	Yes	High Preservation Value	<ul style="list-style-type: none"> Contributes to the Hana Highway Historic Bridge District. Part of best remaining intact example of a belt road system in the state. 20th century example of bridge engineering and construction. Significant for commerce and social history. See National Register of Places Nomination Form in appendices. 	5-118
009003600502502	Makapi'i Stream Bridge	Makapi'i Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	Yes	High Preservation Value	<ul style="list-style-type: none"> Contributes to the Hana Highway Historic Bridge District. Part of best remaining intact example of a belt road system in the state. 20th century example of bridge engineering and construction. Significant for commerce and social history. See National Register of Places Nomination Form in appendices. 	5-121
009003600301008	Maliko Stream Bridge	Maliko Stream	Hana Highway	1961	Concrete Girder	Concrete and Metal	No	Program Comments	This is a typical post-war bridge and falls under Program Comments.	n/a
009004500500536	Mapulehu Bridge	Mapulehu Stream	Kamehameha V Highway	1950	Concrete Slab	Metal Thrie Beam	No	Program Comments	This is a typical post-war bridge and falls under Program Comments.	n/a
009003600502835	Mokulehua Stream Bridge	Mokulehua Stream	Hana Highway	1908	Concrete Slab	Concrete Solid	Yes	High Preservation Value	<ul style="list-style-type: none"> Contributes to the Hana Highway Historic Bridge District. Part of best remaining intact example of a belt road system in the state. 20th century example of bridge engineering and construction. Significant for commerce and social history. See National Register of Places Nomination Form in appendices. 	5-124
009003600500624	Nailiiahaele Bridge	Nailiiahaele Stream	Hana Highway	1930	Concrete Tee Beam	Concrete Open Vertical	Yes	High Preservation Value	<ul style="list-style-type: none"> Contributes to the Hana Highway Historic Bridge District. Part of best remaining intact example of a belt road system in the state. 20th century example of bridge engineering and construction. Significant for commerce and social history. See National Register of Places Nomination Form in appendices. 	5-127
009003600501540	Nuaalua Bridge	Nuaalua Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Open Vertical	Yes	High Preservation Value	<ul style="list-style-type: none"> Contributes to the Hana Highway Historic Bridge District. Part of best remaining intact example of a belt road system in the state. 20th century example of bridge engineering and construction. Significant for commerce and social history. See National Register of Places Nomination Form in appendices. 	5-130

*High Preservation Value: Has unique or exemplary characteristics of a bridge type and exhibits high degrees of historic integrity.
 Eligible: Not unique or the best example of a type, but may become a rare example of a bridge type in the future; reflects characteristics of its bridge type.
 Not Eligible: Has lost historic integrity through significant alteration or does not reflect characteristics from its time period.
 Program Comments: Common post-war bridges built after 1945 covered by Advisory Council program comments.
 Non-Contributing: The bridge/culvert is non-contributing to the historic district.

** This bridge falls under "Not Eligible" or "Program Comments" and has potentially historic resources adjacent to the structure that requires additional consideration.

Inventory Form (State)

General Information

Bridge Number: 009004500500394	Route No: 450
Popular Name: Makakupaia Bridge	
Feature Crossed: Unnamed Stream	
Feature Carried: Kamehameha V Highway	
Milepost: 3.94 mi.	Island: Molokai
Longitude: 156d-57m-57.02s	Latitude: 21d-04m-11.48s
Location: 0.36 Miles West of Hooulu Place	
Historic Name: Makakupaia Bridge	
Designer/Engineer:	
Builder/Contractor:	



Location Map:



009004500500394 Makakupaia Bridge

Construction Information

Bridge Type: Concrete Slab	Construction Date: 1940	Replaced? No
Altered? No Alteration Date(s):		
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 1	Max Span: 20.0 ft.	Total Length: 23.0 ft.	Deck Width: 27.9 ft.
Superstructure: Concrete Slab			
Substructure: Masonry Abutment			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Solid			
Setting:			
Other Features:			

Historic Association

Eligibility Status: Eligible	Criteria: C	State/National Registered? No
Current Function: Bridge		Historic Function: Bridge
Area of Significance: Engineering		
Narrative Description: <p>The Makakupaia Bridge carries Kamehameha V Highway Street across Makakupaia Stream. Located on the island of Molokai, the Makakupaia Bridge is a single-span reinforced concrete, flat slab bridge in its original location, is generally in good condition, and its materials remain intact. The form work is evident on its solid concrete parapets and the bridge has CRM abutments. Metal thrie beams are integrated to the approaches of the parapets however, workmanship of the bridge has not been obscured by additions or repairs. The bridge is scheduled for replacement in 2015.</p>		

009004500500394. Makakupaia Bridge

Significance Statement:

This bridge is eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. It is a good example of the 1940's reinforced concrete flat slab bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design. However this bridge is scheduled for reconstruction in 2015.

009004500500394 Makakupaia Bridge

5 - 117

**APPENDIX E: 2010 BRIDGE INSPECTION REPORT
(Nagamine Okawa Engineers, Inc.)**

1093

ROUTINE (PERIODIC) BRIDGE INSPECTION REPORT

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394
MOLOKAI, HAWAII



For

State of Hawaii
Department of Transportation
Highways Division

Prepared by

Nagamine Okawa Engineers Inc.
1003 Bishop Street
Pauahi Tower, Suite 2025
Honolulu, Hawaii 96813
Telephone: (808) 536-2626

JANUARY 2010

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NBI BRIDGE INSPECTION REPORT

Date of Inspection 1/28/10
 Bridge Number 009004500500394 Bridge Name Makakupaia Bridge
 Number of Spans 1
 Location: Island Molokai Route No. 450 Highway Kamehameha V Hwy
 Feature Intersected Stream Milepost 3.94
 Bridge Material: Superstructure Reinforced Concrete Substructure CRM

	Condition Rating	Remarks
36	TRAFFIC SAFETY FEATURES	Indicate if feature meets currently acceptable standards. 0 - No 1 - Yes N - Not Applicable
1.	Bridge Railings	0
2.	Transitions	0
3.	Approach Guardrail	1
4.	Approach Guardrail Ends	0
58	DECK	
1.	Wearing Surface	6
2.	Decks - Structural Condition	6
3.	Curbs	N
4.	Median	N
5.	Sidewalks	N
6.	Parapet	5
7.	Railing	N
8.	Paint	4
9.	Drains	N
10.	Lighting Standards	N
11.	Utilities	N
12.	Joint Leakage	6
13.	Expansion Joints or Devices	6
	Inspector's Condition Rating	6
		1. AC overlay on bridge deck.
		6. Spall in upstream parapet and delaminations in downstream parapet. Both parapets have hairline vertical cracks 2' to 3' o.c.
		8. Rating is for paint on parapet.
		12. Transverse cracks in AC pavement over inbound and outbound abutments.
59	SUPERSTRUCTURE	
1.	Bearing Devices	N
2.	Stringers	N
3.	Girders, Beams, or Arches	N
4.	Floor Beams and Diaphragms	N
5.	Trusses -General	N
	-Portals	N
	-Bracing	N
6.	Paint	N
7.	Machinery (Moveable Spans)	N
8.	Rivets and/or Bolts	N
9.	Welds - Cracks	N
10.	Rust	N
11.	Timber Decay	N
12.	Concrete Cracking and/or Spalling	6
13.	Collision Damage	7
14.	Deflection Under Load	7
15.	Alignment of Members	7
16.	Vibrations Under Load	7
17.	Flat Slab	6
	Inspector's Condition Rating	6
		12. Spalls along upstream slab edge. Deck slab soffit coated with mud/dirt.
		17. See item 59.12

Date of Inspection 1/28/10 Bridge Name Makakupaia Bridge
Bridge Number 009004500500394

93 CRITICAL FEATURE INSPECTION DATE

Provide date if applicable.
If not applicable, indicate with N.

- | | | |
|------------------------------|----------|--|
| 1. Fracture Critical Details | <u>N</u> | |
| 2. Underwater Inspection | <u>N</u> | [If applicable, submit Underwater Inspection Report] |
| 3. Other Special Inspection | <u>N</u> | |

OTHER FEATURES

Y - Yes N - No

Remarks

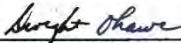
- | | | |
|---|----------|-----------------------------------|
| 1. Bridge Posted? | <u>N</u> | Posted Limit = <u>-</u> |
| 2. Signage for Posting Legible/Visible? | <u>-</u> | |
| 3. Riding Surface (Roughness) Rating | <u>2</u> | 3 - Smooth, 2 - Average, 1 - Poor |

REPAIRS AND IMPROVEMENTS

- List all work done to this bridge since the last inspection including cost.
None.
- Indicate proposed and/or recommended improvements including estimated cost.
 - Upgrade bridge railings and guardrail ends to current standards (Est. Cost = \$45,000).
 - Repair damaged guardrail and guardrail end (Est. Cost = \$6,000).
 - Clear vegetation from stream channel (Maintenance Item).
- List any existing temporary conditions.

REMARKS AND RECOMMENDATIONS

- Does this bridge require inspection by Bridge Design Section? Yes _____ No x
[This should only be addressed by in-house inspectors who are not structural engineers.]
- Remarks: Describe defects. Use sketches, diagrams and/or photographs where possible.

Inspected by:	Name (printed):	<u>Garrett Nago</u>	Title:	<u>Certified Bridge Inspector</u>
	Signature:	<u></u>		
	Phone Number:	<u>808.536.2626</u>		
Supervised by:	Name (printed):	<u>Dwight Okawa, S.E.</u>	Title:	<u>V.P.</u>
	Signature:	<u></u>		
	Phone Number:	<u>808.536.2626</u>		

Date of Inspection 1/28/10 Bridge name Makakupaia Bridge
 Bridge Number 009004500500394

	Condition Rating	Remarks
60 SUBSTRUCTURE		
1. Abutment -Wings	6	This rating is for the CRM breastwall. Footing not visible for inspection.
-Backwall/Breastwall	6	
-Footing	-	
-Piles	N	
-Erosion	7	
-Settlement	7	
2. Piers or Bents -Caps	N	
-Column/Wall	N	
-Footing	N	
-Piles	N	
-Scour	N	
-Settlement	N	
3. Pile bents	N	
4. Concrete Cracking and/or Spalling	6	
5. Steel Corrosion	N	
6. Timber Decay, etc.	N	
7. Debris on Seats	N	
8. Paint	N	
9. Collision Damage	8	
Inspector's Condition Rating	6	

61 CHANNEL & CHANNEL PROTECTION		
1. Channel Scour	7	
2. Embankment Erosion	7	
3. Drift	5	3. Aggradation of silt and rocks under bridge.
4. Vegetation	4	4. Dense vegetation upstream and downstream blocking the stream channel.
5. Channel Change	7	
6. Fender System	N	
7. Spur Dikes & Jetties	N	
8. Rip Rap	N	
9. Adequacy of Opening	4	9. Mud/dirt coated on deck slab soffit shows evidence of the bridge opening being inadequate.
Inspector's Condition Rating	5	

62 CULVERT & RETAINING WALLS		
1. Barrel -Concrete	N	
-Steel	N	
-Timber	N	
2. Headwall	N	
3. Cutoff Wall	N	
4. Adequacy	N	
5. Debris	N	
Inspector's Condition Rating	N	

**STATE OF HAWAII DEPARTMENT OF TRANSPORTATION
PONTIS BRIDGE INSPECTION REPORT**

r10/8/07

Date of Inspection 1/28/2010 Bridge Name Makakupaia Bridge
 Bridge Number 009004500500394 Route No. 450
 Number of Spans 1 Highway Kamehameha V Hwy
 Location: Island Molokai Feature Intersected Stream

ELEM NO.	ELEMENT DESCRIPTION	ENV. (Note 1)	TOTAL QUANT.	UNIT	ST 1	ST 2	ST 3	ST 4	ST 5
39	DECK OR SLAB (Note 2)	2	598	SF.	598				
*	GIRDERS			LFT.					
217	ABUTMENTS	2	56	LFT.		56			
*	COLUMNS			EA.					
*	PIER WALL			LFT.					
*	PIER CAPS			LFT.					
301	JOINTS (INSPECTOR NEEDS TO INPUT ELEM NO. & QTY.)	2	52	LFT.	26	26			
331	BRIDGE RAILING	2	46	LFT.		23	23		
*	APPROACH SLABS			EA.					
*	BEARINGS (INSPECTOR NEEDS TO INPUT ELEM NO. & QTY.)			EA.					
*	CULVERT			LFT.					
*	SMART FLAG: STEEL FATIGUE			EA.					
*	SMART FLAG: PACK RUST			EA.					
*	SMART FLAG: DECK CRACKING (ON TOP OF DECK ONLY)			EA.					
359	SMART FLAG: SOFFIT OF CONC. DECK OR SLAB (THIS SMART FLAG IS MANDATORY IF DECK OR SLAB HAS AN A.C. OVERLAY).	2	1	EA.	1				
*	SMART FLAG: SETTLEMENT			EA.					
*	SMART FLAG: SCOUR			EA.					
*	SMART FLAG: TRAFFIC IMPACT (TRAFFIC IMPACT TO SUPERSTRUCTURE ONLY)			EA.					
*	SMART FLAG: SECTION LOSS			EA.					
OTHERS:									

COMMENTS:

ELEM NO. 359: Slab soffit coated with mud/dirt.

Note 1: For each element, the inspector shall code the type of environment from the following key:

Env 1: Benign & Low Env: Little or no env. conditions affecting deterioration. Past bridge inspections show that env. has caused little or no deterioration.

Env 2: Moderate: Moderate level of environmental influence or deterioration. Past bridge inspections show that environment has caused some deterioration.

Env 3: Severe: Severe level of environmental influence or deterioration. Past bridge inspections show that environment has caused significant.

Note 2: For DECKS ONLY: All quantity in one ST only. Deck/slab is rated from top of deck/slab only. Use soffit smart flag (elem 359) to rate soffit.

Use these revised Condition States for rating Concrete Decks/Slabs	
CS1	No patched areas, no potholes, no spalls and delams, etc.
CS2	Distressed areas are less than 2% of the total deck area.
CS3	Distressed areas are more than 2% but 10% or less of the total deck area.
CS4	Distressed areas are more than 10% but 25% or less of the total deck area.
CS5	Distressed areas are 25% or more of the total deck area.

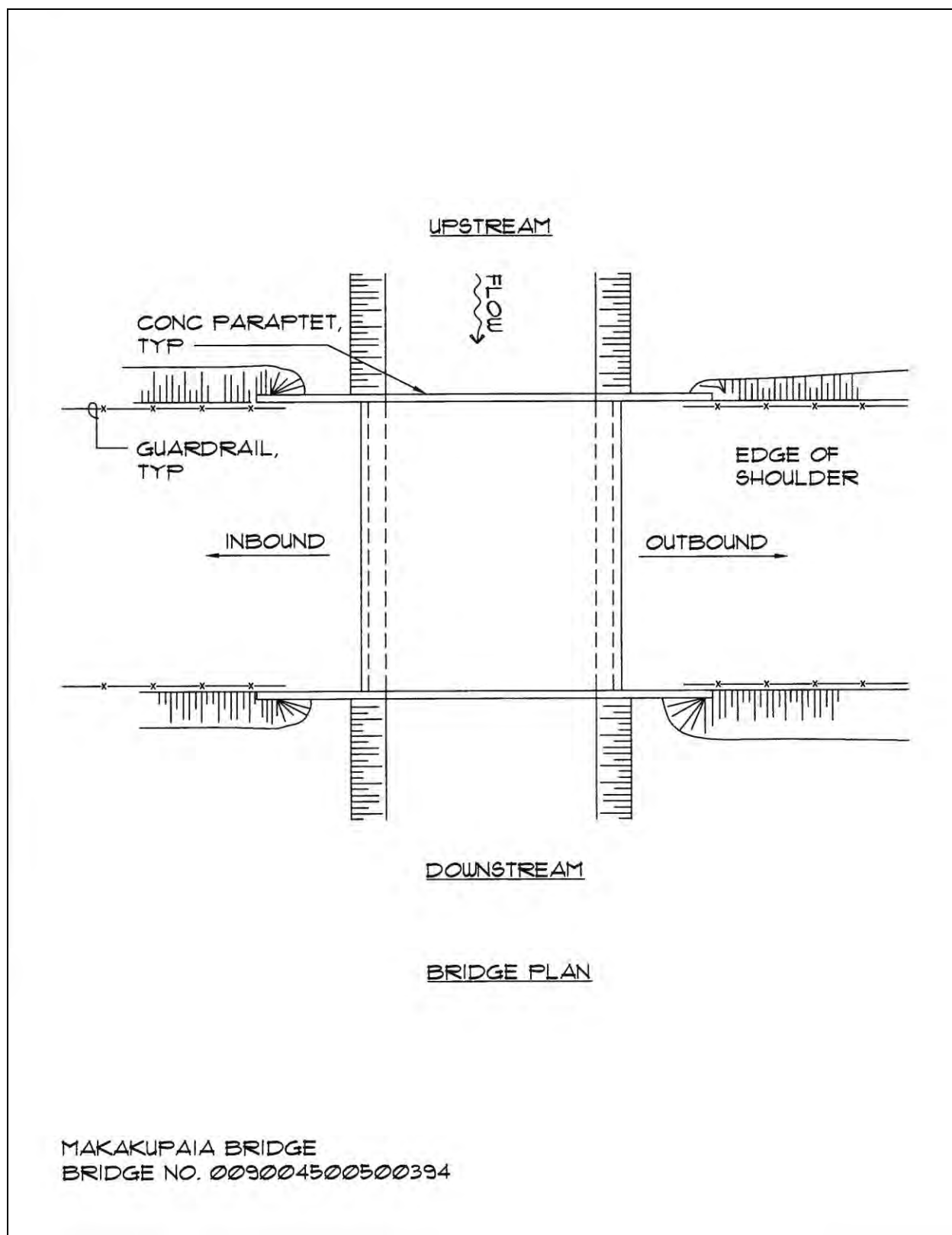
Inspector's Name (printed): Garrett Nago & Robin Okawa
 Inspector's Name (signature): [Signature]
 Inspector's phone number: 808.536.2626

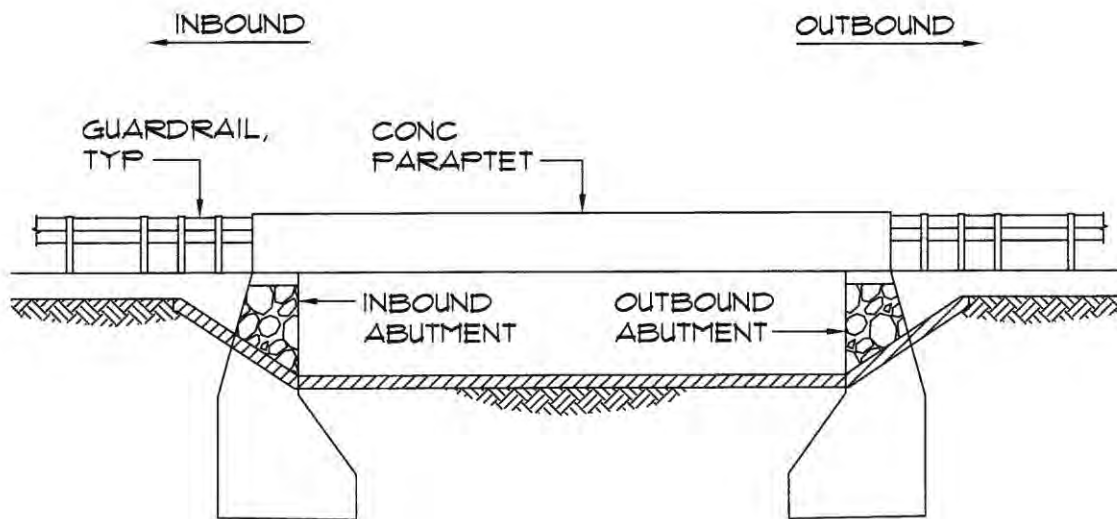
Title: Cert. Bridge Inspector

Supervisor's Name (printed): Dwight Okawa, S.E.
 Supervisor's Name (signature): [Signature]

Title: V.P.

100 9/9/10





DOWNSTREAM BRIDGE ELEVATION

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394

**MAKAKUPAIA BRIDGE
PHOTO LOG
Bridge No. 009004500500394**

PHOTO NO.	DESCRIPTION
1	APPROACH TO BRIDGE LOOKING OUTBOUND
2	APPROACH TO BRIDGE LOOKING INBOUND
3	UPSTREAM INBOUND GUARDRAIL TRANSITION
4	UPSTREAM BRIDGE PARAPET WITH BUILD UP OF DIRT AND WEEDS GROWING
5	UPSTREAM OUTBOUND APPROACH GUARDRAIL TRANSITION
6	SPALL IN UPSTREAM PARAPET NEAR OUTBOUND END
7	COLLISION DAMAGE IN UPSTREAM OUTBOUND APPROACH GUARDRAIL END
8	DOWNSTREAM OUTBOUND GUARDRAIL TRANSITION
9	DOWNSTREAM BRIDGE PARAPET WITH BUILD UP OF DIRT AND WEEDS GROWING
10	TYPICAL HAIRLINE CRACK IN DOWNSTREAM BRIDGE PARAPET
11	SPALLS AND DELAMINATIONS ALONG BASE OF DOWNSTREAM BRIDGE PARAPET
12	DOWNSTREAM INBOUND APPROACH GUARDRAIL TRANSITION
13	MISSING SPACER BLOCK BETWEEN BRIDGE PARAPET ENDWALL AND GUARDRAIL
14	VIEW OF AC PAVEMENT OVER BRIDGE
15	TRANSVERSE CRACK IN AC PAVEMENT OVER OUTBOUND ABUTMENT
16	CLOSE UP VIEW OF TRANSVERSE CRACK IN AC PAVEMENT OVER OUTBOUND ABUTMENT AND POTHOLE
17	TRANSVERSE CRACK IN AC PAVEMENT OVER INBOUND ABUTMENT
18	LONGITUDINAL CRACK IN AC PAVEMENT
19	DOWNSTREAM BRIDGE ELEVATION
20	UPSTREAM BRIDGE ELEVATION
21	VIEW OF OVERALL SOFFIT LOOKING DOWNSTREAM
22	SPALLS ALONG UPSTREAM SOFFIT EDGE
23	CRM CHANNEL WALL AT DOWNSTREAM INBOUND END
24	INBOUND ABUTMENT

**MAKAKUPAIA BRIDGE
PHOTO LOG
Bridge No. 009004500500394**

25	OUTBOUND ABUTMENT
26	UPSTREAM VIEW OF STREAM CHANNEL
27	DOWNSTREAM VIEW OF STREAM CHANNEL



PHOTO 1 APPROACH TO BRIDGE LOOKING OUTBOUND



PHOTO 2 APPROACH TO BRIDGE LOOKING INBOUND

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 3 UPSTREAM INBOUND GUARDRAIL TRANSITION



PHOTO 4 UPSTREAM BRIDGE PARAPET WITH BUILD UP OF DIRT AND WEEDS GROWING

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 5 UPSTREAM OUTBOUND APPROACH GUARDRAIL TRANSITION



PHOTO 6 SPALL IN UPSTREAM PARAPET NEAR OUTBOUND END

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 7 COLLISION DAMAGE IN UPSTREAM OUTBOUND APPROACH GUARDRAIL END



PHOTO 8 DOWNSTREAM OUTBOUND GUARDRAIL TRANSITION

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 9 DOWNSTREAM BRIDGE PARAPET WITH BUILD UP OF DIRT AND WEEDS GROWING



PHOTO 10 TYPICAL HAIRLINE CRACK IN DOWNSTREAM BRIDGE PARAPET

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 11 SPALLS AND DELAMINATIONS ALONG BASE OF DOWNSTREAM BRIDGE PARAPET



PHOTO 12 DOWNSTREAM INBOUND APPROACH GUARDRAIL TRANSITION

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 13 MISSING SPACER BLOCK BETWEEN BRIDGE PARAPET ENDWALL AND GUARDRAIL



PHOTO 14 VIEW OF AC PAVEMENT OVER BRIDGE

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 15 TRANSVERSE CRACK IN AC PAVEMENT OVER OUTBOUND ABUTMENT



PHOTO 16 CLOSE UP VIEW OF TRANSVERSE CRACK IN AC PAVEMENT OVER OUTBOUND ABUTMENT AND POTHOLE

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 17 TRANSVERSE CRACK IN AC PAVEMENT OVER INBOUND ABUTMENT



PHOTO 18 LONGITUDINAL CRACK IN AC PAVEMENT

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 19 DOWNSTREAM BRIDGE ELEVATION



PHOTO 20 UPSTREAM BRIDGE ELEVATION

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 21 VIEW OF OVERALL SOFFIT LOOKING DOWNSTREAM



PHOTO 22 SPALLS ALONG UPSTREAM SOFFIT EDGE

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 23 CRM CHANNEL WALL AT DOWNSTREAM INBOUND END



PHOTO 24 INBOUND ABUTMENT

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 25 OUTBOUND ABUTMENT



PHOTO 26 UPSTREAM VIEW OF STREAM CHANNEL

MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394



PHOTO 27 **DOWNSTREAM VIEW OF STREAM CHANNEL**

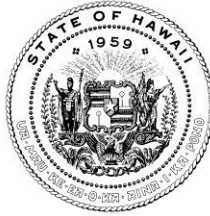
MAKAKUPAIA BRIDGE
BRIDGE NO. 009004500500394

APPENDIX C

NHPA Section 106 Documentation

HRS Chapter 6E Documentation

DAVID Y. IGE
GOVERNOR OF
HAWAII



**STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES**

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

DEAN D. UYENO
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

January 15, 2019

Meesa Otani
U.S. Department of Transportation
Federal Highway Administration
300 Ala Moana Blvd, Rm 3-306
Box 50206
Honolulu, Hawai'i 96850
Email: meesa.otani@dot.gov

IN REPLY REFER TO:
Log No.: 2018.02878
Doc. No.: 1812SH12
Archaeology, Architecture

Dear Meesa Otani:

**SUBJECT: National Historic Preservation Act (NHPA) Section 106 Review –
Request for Concurrence with Determination of No Historic Properties Affected
Kamehameha V Highway, Makakupaia Bridge Replacement
Ref. No. HDA-HI, Federal Aid Project No. STP-0450(010)
Kawela Ahupua'a, Kona District, Island of Molokai
TMK: (2) 5-4-003:028 (por.); 5-4-017:044 (por.)**

The State Historic Preservation Division (SHPD) received a letter dated December 6, 2018 from the Federal Highway Administration (FHWA) to request the State Historic Preservation Officer's (SHPO's) concurrence with FHWA's Section 106 effect determination for the Kamehameha V Highway, Makakupaia Bridge Replacement project on the island of Molokai. The SHPD received this submittal on December 6, 2018.

The project will receive funding from the Federal Highways Administration (FHWA) and is therefore a federal undertaking as defined in 36 CFR 800.16(y). The proposed undertaking is subject to compliance with Section 106 of the NHPA and historic preservation review under Hawaii Revised Statutes (HRS) §6E-8. Pursuant to the Programmatic Delegation of Authority (May 2016), the FHWA has delegated Section 106 consultation to the Hawai'i Department of Transportation (HDOT).

The area of potential effect (APE) is defined as two areas totaling approximately 3.3 acres. The first area is a multi-sided shaped boundary located from approximately mile point 3.85 to mile point 4.02 along Kamehameha V Highway. This area includes the HDOT right-of-way (existing bridge and highway approaches) and adjacent property for the temporary bypass road (north of the highway). The total acreage of this area is approximately 2.8 acres. The parcel on which the temporary bypass road is situated is TMK: (2) 5-4-003:028. The second area is a rectangular shaped boundary located from approximately mile point 4.13 to mile point 4.16 along Kamehameha V Highway and north of the highway. This area includes the contractor's staging area and totals approximately 0.5 acres. It is located on TMK: (2) 5-4-003:028 and is owned by Kawela Plantation Homeowners Association. The State Historic Preservation Officer concurred with the APE in a letter dated June 28, 2016 (Log No: 2016.01398, Doc No: 1606JLP20). TMK (2) 5-4-017:044 is a parking lot owned by the County of Maui for beach access that may require closure during the project, therefore it has been included as a portion of the project area [email HDOT (Justin Rush) to SHPD (Stephanie Hacker)].

The proposed project involves replacing the existing Makakupaia bridge. The new bridge would be 49-feet long by approximately 42-feet wide, with two 12-foot wide traffic lanes and 8-foot wide shoulders for pedestrians and cyclists on each side. The improvements include new 20-foot long approach slabs at each end of the bridge, and concrete bridge railing. The replacement bridge would be constructed entirely within the highway right-of-way. The

temporary bypass road would be constructed on the mauka side of the highway on privately-owned land, and would be approximately 600 feet long, with two 11-foot wide lanes and 4-foot shoulders on both sides. A contractor staging area is also located on the mauka side of the highway east of the bridge.

No significant ground excavation or dewatering would be required for the new bridge construction. The 3-foot diameter drilled shafts to support the new bridge superstructure will be approximately 40-60 feet deep. The shafts will be augured and the clay, sand and basalt rock that is removed from the cased shafts would be placed into holding basins and removed from the site. Tremie concrete would be pumped into the shafts and any groundwater that is displaced during the tremie process would be contained and routed/pumped to a holding basin.

Previous archaeological investigations in the vicinity of the project area identified several historic properties. However, a 100 percent pedestrian survey was conducted within the project area; no surface archaeological resources or cultural deposits were identified by the surface survey.

According to the 2013 Hawaii State Historic Bridge Inventory and Evaluation (bridge inventory), the bridge is considered eligible for the State Register as a good example of a 1940s reinforced concrete flat slab bridge and associated with early developments in concrete bridge construction in Hawaii (criterion C). The bridge inventory states, "workmanship of the bridge has not been obscured by additions or repairs" (MKE Associates LLC, Fung Associates, Inc 2013: 5-116).

Contrary to the bridge inventory, significant upgrades to the bridge were completed between 1978 and 2014 that include modifications and additions to the concrete railings, replacement of the end posts, installation of guardrails, and conversion of the concrete deck to asphalt, affecting the historical characteristic of the bridge to where it is not a true representation of a 1940s concrete flat slab bridge.

A Historic Property Evaluation was recently completed on the Makakupaia Bridge and was submitted concurrently with FHWA's subject determination letter. The historic property evaluation concluded, "Modifications detract from the historic integrity of the original parapet design, the bridge's most visible feature: The addition of concrete raised its height from roughly 2' to 2'-8" and obscured its original edge details and some of the original board-formed concrete. The curving end sections added to the parapet in 1979 differ in design and feeling from the original linear parapet design. These changes result in a lack of integrity of design, feeling, workmanship and association that preclude eligibility for the State and National Registers."

The SHPD concurred with the significance assessment of the Makakupaia Bridge stating, "although the bridge was once eligible, the changes that accrued over the years to the bridge have diminished its integrity and lack historic significance". SHPD also concurred with the Chapter 6E-8 effect determination, "no historic properties affected", for the proposed project [January 7, 2018; SHPD Log No. 2018.02724, Doc. No. 1812TGM11].

Per 36 CFR 800.4(d)(1), **the SHPO concurs** with FHWA's determination of *no historic properties affected*.

The HDOT and FHWA are the offices of record for this undertaking. Please maintain a copy of this letter with your environmental review record for this undertaking.

Please contact Tanya Gumapac-McGuire, Architectural Historian, at (808) 692-8022 or at Tanya.Gumapac-McGuire@hawaii.gov regarding architectural resources and Stephanie Hacker, Historic Preservation Archaeologist IV, at (808) 692-8046 or at Stephanie.Hacker@hawaii.gov regarding archaeological resources or this letter.

Aloha,

Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Christine Yamasaki, HDOT (christine.yamasaki@hawaii.gov)
Misako Mimura, HDOT (misako.k.mimura@hawaii.gov)
Justin Rush, HDOT (justin.se.rush@hawaii.gov)



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

JADE T. BUTAY
DIRECTOR

Deputy Director
ROY CATALANI
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
HWY-DD 2.8184

November 20, 2018

TO: THE HONORABLE SUZANNE CASE, CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTN: ALAN S. DOWNER, PH.D.
ADMINISTRATOR AND DEPUTY HISTORIC PRESERVATION
OFFICER
STATE HISTORIC PRESERVATION DIVISION

FROM: CURTIS MATSUDA *Curtis Matsuda*
ACTING ENGINEERING PROGRAM MANAGER
DESIGN BRANCH, HIGHWAYS DIVISION

SUBJECT: HAWAII REVISED STATUTES CHAPTER 6E-8 REVIEW
KAMEHAMEHA V HIGHWAY, MAKAKUPAIA BRIDGE
REPLACEMENT
FEDERAL-AID PROJECT NO. STP-0450(010)
KAWELA AHUPUAA, KONA DISTRICT, ISLAND OF MOLOKAI
TAX MAP KEY(S): TMK (2) 5-4-003:28 por. and (2) 5-4-017:44 por.

In accordance with Hawaii Revised Statutes (HRS) Chapter 6E-8, the Hawaii Department of Transportation (HDOT) requests the State Historic Preservation Officer's concurrence on the effect determination for the proposed improvements to the Makakupaia Bridge. The HDOT is rendering a determination of "no historic properties affected" for the subject project.

The Federal Highway Administration (FHWA) will provide funds for the proposed improvements. Therefore, this project is considered a federal undertaking as defined in the National Preservation Act (NHPA) of 1966, as amended (36 CFR 800(y)). The FHWA has authorized the HDOT to act on behalf of the FHWA regarding the NHPA Section 106 notification and consultation (letter dated February 1, 2016). Consultations under both Section 106 of NHPA and HRS Chapter 6E have been conducted concurrently.

Overview of the Undertaking

The proposed project is located in the Kawela *ahupuaa* on the island of Molokai (see Attachment A: Enclosures 1 & 2). The project area includes two areas totaling approximately 3.3 acres.

The first area is a multi-sided shaped boundary located from approximately mile point 3.85 to mile point 4.02 along Kamehameha V Highway. This area includes the HDOT right-of-way (existing bridge and highway approaches) and adjacent property for the temporary bypass road (north of the highway). Total area is approximately 2.8 acres. The parcel on which the temporary bypass road is situated is TMK: (2) 5-4-003:028.

The second area is a rectangular shaped boundary located from approximately mile point 4.13 to mile point 4.16 along Kamehameha V Highway and north of the highway. This area includes the contractor's staging area (approximately 0.5 acres). This area is located on TMK: (2) 5-4-003:028 and is owned by Kawela Plantation Homeowners Association.

The proposed project will replace the existing Makakupaia bridge. The new bridge will be 49 feet long by approximately 42 feet wide, with two 12-foot wide traffic lanes and 8-foot wide shoulders for pedestrians and cyclists on each side. The improvements will include new 20-foot long approach slabs at each end of the bridge, and concrete bridge railing. The replacement bridge will be constructed entirely within the highway right-of-way. The temporary bypass road will be constructed on the mauka side of the highway on privately-owned land, and will be approximately 600 feet long, with two 11-foot wide lanes and 4-foot shoulders on both sides. A contractor staging area is also located on the *mauka* side of the highway east of the bridge.

No significant ground excavation or dewatering will be required for the new bridge construction. The 3-foot diameter drilled shafts that will support the new bridge superstructure will be approximately 40 to 60 feet deep. The shafts will be augured and the clay, sand and basalt rock that is removed from the cased shafts will be placed into holding basins and removed from the site (see Attachment D). Tremie concrete will be pumped into the shafts and any groundwater that is displaced during the tremie process will be contained and routed/pumped to a holding basin.

Consultation Overview

The HDOT consulted with the Department of Land and Natural Resources (DLNR) State Historic Preservation Division (SHPD) regarding the project area. The State Historic Preservation Officer concurred with the project area on June 28, 2016, under Section 106 of Historic Preservation Act (Log No: 2016.01398, Doc No: 1606JLP20).

Consultation letters, dated July 18, 2017, were sent to the following organizations.

Ahupuaa o Molokai
Association of Hawaiian Civic Clubs
Association of Hawaiians for Homestead Lands
Department of Hawaiian Home Lands
Hoolehua Hawaiian Civic Club
Hui o Kuapa

Kalamaula Mauka Homestead Association
Molokai Homestead Farmers Association
Molokai Island Burial Council
Molokai Land Trust
Molokai Planning Commission
Na Puuwai
Nature Conservancy – Molokai
Office of Hawaiian Affairs
State Historic Preservation Division

SHPD and the Molokai Planning Commission (transmitted by the County of Maui Department of Planning) have responded to the consultation letter.

A response letter from SHPD received on September 11, 2017 (Log No: 2017.01544, Doc. No: 1709SH06) asked for the proposed bridge replacement with location, depth, dimensions, known historic properties in the vicinity of the project area, and the probability of encountering historic properties within and in its the vicinity. A response letter dated February 7, 2018 responded to the questions asked by SHPD. SHPD responded to this letter on March 1, 2018 (Log No. 2018.00327, Doc. No: 1803SH01) to continue the Section 106 process.

A response letter received on January 17, 2018 from the Molokai Planning Commission (see Attachment B) requested several items such as an APE stake holders list, contact with the Molokai archaeologist, consultation with Kawela Plantation Association, and a monitoring plan during construction. HDOT sent a response letter dated March 6, 2018 (Letter No. HWY-DD 2.6555) responding to each of the requests showing compliance and our legal obligations to the preservation of traditional cultural resources if found during construction.

In addition, on July 18, 2017, a Section 106 public notice was published in the Honolulu Star-Advertiser regarding the undertaking. There was one response to this public notice; Maui County Department of Public Works indicated that they had no comments at this time.

Historical, Cultural, and Archaeological Background

The south side of Molokai, including the region surrounding the project area, was the scene of fierce interisland battles. The south side of the island is also the location of numerous large fishponds that were important sources of protein for native Hawaiians.

Previous archaeological investigations in the vicinity of the project area identified several historic sites. A consultation letter transmitted by HDOT to DLNR, dated February 7, 2018, cited no known historical properties in the APE. Several are located outside the APE which were found through previous archaeological investigations.

Makakupaia bridge was originally constructed in 1940. The bridge is described as:

“single-span reinforced concrete, flat slab bridge in its original location, is generally in good condition, and its materials remain intact. The form work is evident on its solid concrete parapets and the bridge has CRM abutments. Metal thrie beams are integrated to the approaches of the parapets however, workmanship of the bridge has not been obscured by additions or repairs” from the Hawaii State Historic Bridge Inventory Evaluation conducted in 2013 (MKE Associates LLC, Fung Associates, Inc. 2013: 5-116)

According to the referenced draft inventory, the bridge is considered eligible for the State Register as a good example of a 1940s reinforced concrete flat slab bridge, and associated with early developments in concrete bridge construction in Hawaii (criterion C). The bridge inventory states, “workmanship of the bridge has not been obscured by additions or repairs” (MKE Associates LLC, Fung Associates, Inc 2013: 5-116).

Contrary to the referenced bridge inventory survey, significant upgrades to the bridge have been done in recent years including modifications and additions to the concrete railings, replacement of end posts, installation of guardrails, and conversion of the concrete deck to asphalt, affecting the historical characteristic of the bridge to where it is not a true representation of a 1940s concrete flat slab bridge. A recent Historic Property Evaluation was done on the Makakupaia Bridge and is being submitted concurrently with this determination letter to the SHPD (see Attachment C). The historic property evaluation concluded “Modifications detract from the historic integrity of the original parapet design, the bridge’s most visible feature: The addition of concrete raised its height from roughly 2’ to 2’-8”, and obscured its original edge details and some of the original board-formed concrete. The curving end sections added to the parapet in 1979 differ in design and feeling from the original linear parapet design. These changes result in a lack of integrity of design, feeling, workmanship and association that preclude eligibility for the State and National Registers.”

Summary of Historic Sites within the Project Area

A 100 percent surface (pedestrian) survey was conducted within the project area. No surface archaeological resources or cultural deposits were identified by the surface survey. Because of the lack of any cultural resources being identified, there is a very low potential to encounter any cultural resources within the project area.

Effect Determination

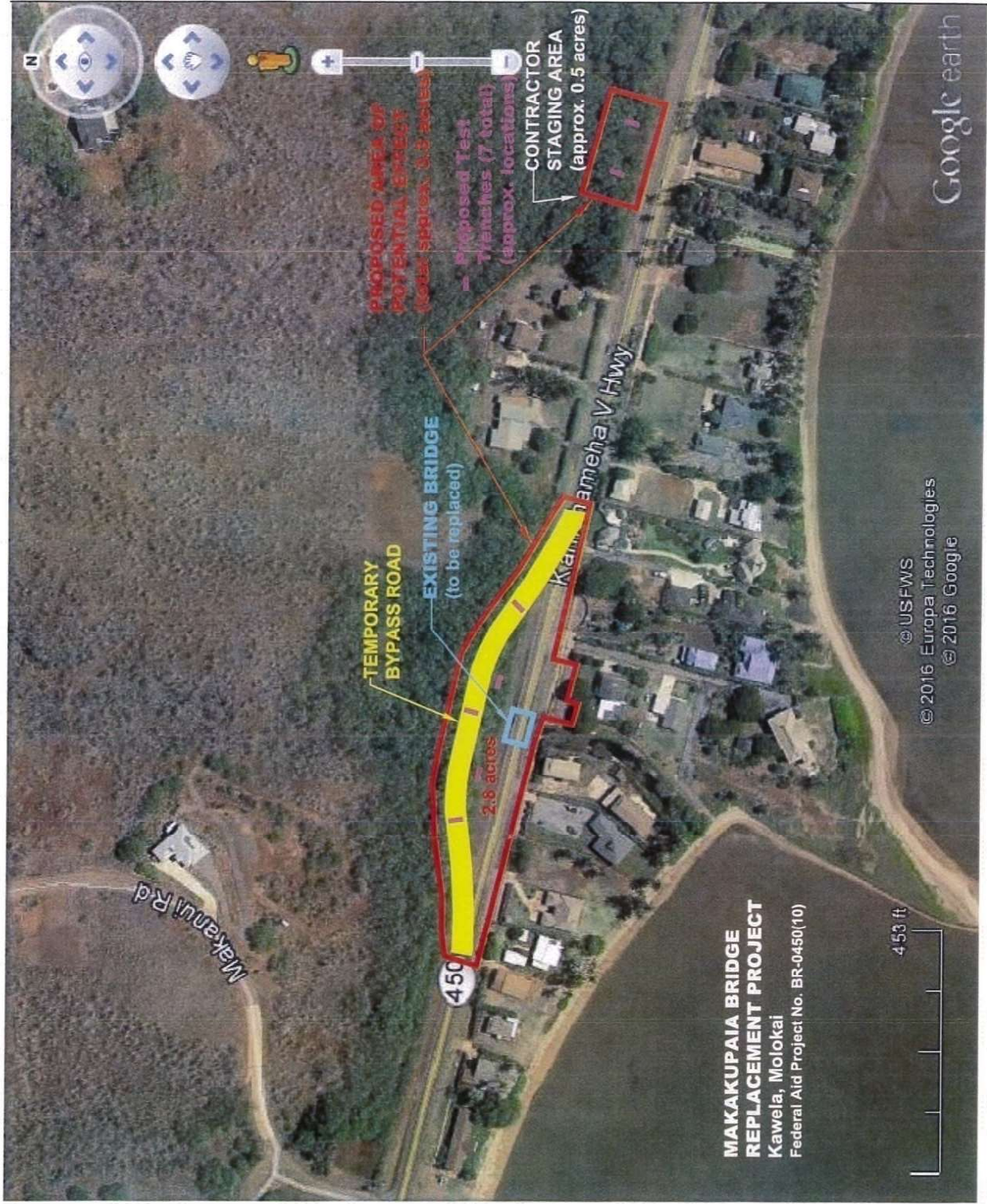
Based on our analysis, site observations, and consultation with the SHPD and others, the HDOT has determined that there will be no historic properties affected by this undertaking.

If the SHPD objects to the “no historic properties affected” determination for the Kamehameha V Highway, Makakupaia Bridge Replacement project, please inform us within 90 days from date of receipt. In the absence of a SHPD response by this date, the HDOT will assume the SHPD concurrence with this determination and will proceed with the undertaking.

Please feel free to contact HDOT Project Manager, Christine Yamasaki by telephone at (808) 692-7572 or by email at christine.yamasaki@hawaii.gov, if you have any questions. We look forward to working with the SHPD on these needed improvements.

Attachments

Enclosure (1)



ATTACHMENT B

ALAN M. ARAKAWA
Mayor

WILLIAM R. SPENCE
Director

MICHELE CHOUTEAU McLEAN
Deputy Director



COUNTY OF MAUI
DEPARTMENT OF PLANNING

January 17, 2018

Ms. Karen Chun
Design Branch, Highways Division
State of Hawaii, Department of Transportation
601 Kamokila Boulevard, Room 609
Kapolei, Hawaii 96707

Dear Ms. Chun:

SUBJECT: REQUEST FOR COMMENT ON NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION REGARDING MAKAKUPAIA BRIDGE REPLACEMENT, LOCATED ON KAMEHAMEHA V HIGHWAY, KAWELA AHUPUAA, KONA DISTRICT, ISLAND OF MOLOKAI, HAWAII; TMK (2) 5-4-003:028 (POR.) AND (2) 5-4-017:044 (POR.) (RFC 2016/0114)

The Department of Planning (Department) is in receipt of the above-referenced application for consultation in which the project involves a proposed bridge replacement project for Makakupaia Bridge which is located along the Kamehameha V Highway on the Island of Molokai. The proposed project is located on TMK (2) 5-1-003:028 (POR.) and (2) 5-4-017:044, (POR.)

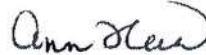
The Department is transmitting the Molokai Planning Commission (MoPC) comments which was presented on the Molokai Planning Commission agenda on November 8, 2017. MoPC comments are as follows:


- Requests for a stakeholder list of Section 106 regarding the areas of potential effect (APE)
- Requests to contact Molokai Archeologist, Cheney Ann Pulama Lima (Maioho) for further review
- Requests for an Archeological Monitoring Plan at time of construction to include inadvertent finds as a priority
- Requests for links to additional information regarding the project
- Requests to consult with the Kawela Plantation Association and utilize the archeological inventory and case study that was historically done in Kawela Ahupuaa

Ms. Karen Chun
January 17, 2018
Page 2

Thank you for the opportunity to comment. Should you require further clarification, please contact Staff Planner Sybil Lopez by email at sybil.lopez@mauicounty.gov or by phone at (808) 270-5529.

Sincerely,



 CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

for WILLIAM SPENCE
Planning Director

Attachment

xc: John S. Rapacz, Planning Program Administrator (PDF)
Sybil K. Lopez, Staff Planner (PDF)
Ms. Christine Yamasaki, Consultant (PDF)
Project File

WRS:CIY:SKL:rma

K:\WP_DOCS\PLANNING\RFC\2016\0114_Makakupaia Bridge\MakakupaiaBridgeCommentLetter.doc

**MOLOKAI PLANNING COMMISSION
SUMMARY MINUTES
NOVEMBER 8, 2017**

A. CALL TO ORDER

The regular meeting of the Molokai Planning Commission was called to order by Chairperson Lawrence Lasua on Wednesday, November 8, 2017, at approximately 11:07 a.m., at Mitchell Pauole Center, 90 Ainoa Street, Kaunakakai, Island of Molokai 96748

A quorum of the Commission was present (see Record of Attendance).

- B. PUBLIC TESTIMONY** - At the discretion of the Chair, public testimony may also be taken when each agenda item is discussed, except for contested cases under Chapter 91, HRS. Individuals who cannot be present when the agenda item is discussed may testify at the beginning of the meeting instead and will not be allowed to testify again when the agenda item is discussed unless new or additional information will be offered. Testimony will be limited to a maximum of three (3) minutes, with 30 seconds to conclude.

C. COMMUNICATIONS

1. **FORD FUCHIGAMI, DIRECTOR, STATE DEPARTMENT OF TRANSPORTATION**, requesting comments from the Molokai Planning Commission regarding the National Historic Preservation Act (NHPA), Section 106 Consultation, on the Makakupaia Bridge Replacement Project on Kamehameha V Highway, TMK: (2) 5-4-003:028 (por.) and (2) 5-4-017:044 (por.), Kawela, Island of Molokai. (Federal Aid Project No. BR-0450(10)) (S. Lopez) (Request letter was distributed with the August 23, 2017 agenda packet. The matter was previously scheduled for the August 23, 2017 and September 13, 2017 meetings, which both lost quorum soon after the meetings were called to order and therefore needed to be canceled.) (*Commissioners: Please bring your documents*).

The Commission may provide its comments.

It was moved by Commissioner Lori Buchanan, seconded by Commissioner Poepoe, then

VOTED: that the Commission's feedback for Makakupaia Bridge Project be transmitted to the Planning Director and staff.

(Assenting - X. Bicoy; L. Buchanan; L. Lasua; J. Pele; L. Poepoe)
(Excused - B. Buchanan)

2. **CHRIS HART & PARTNERS** on behalf of **KALUAKOI POOLSIDE, LLC** and **KUKUI (MOLOKAI), INC.** requesting a Special Management Area (SMA) Minor Permit for the removal and demolition of an existing luau pavilion and

State Historic Preservation Division
Historic Property Evaluation – Survey Form

Instructions: Submit this completed form with the completed SIHP request form and 6E Filing Fee Form electronically to: dlmr.intake.shpd@hawaii.gov

For additional guidance on completing this form, please see the Architecture Branch Survey Guidelines available on the SHPD website.

1. Review Type: Indicate which review process this survey was requested under

- ☒ HRS 6E-08, HAR 13-275 ☐ HRS 6E-42, HAR 13-284

2. Project Information: Indicate the document in which this survey was requested

2.1) Log No. [e.g. 2017.1234] **2016.01398**

2.2) Doc No. [e.g. 1708MB27] **1606JLP20**

2.3) Other:

3. Contact Information:

3.1) Name: **Polly Tice**

3.2) Company: **Mason Architects**

3.3) Street Address: **119 Merchant Street, Suite 501, Honolulu**

3.4) County:

3.5) State: **HI**

3.6) Zip Code: **96813**

3.7) Phone:

3.8) Email:

4. Property Location:

4.1) TMK [e.g. (3) 1-2-003:004]: **(2) 5-4-003:28 por.**

4.2) Street Address: **(Island of Molokai) Kamehameha V Highway (no address number)**

4.3) County:

4.4) State: **HI**

4.5) Zip Code:

5. Property Classification:

5.1) Ownership:

☐ Private

☒ Public

5.2) Classification

☐ Building

☐ District

☐ Site

☒ Structure

☐ Object

6. Property Function:

6.1) Current: **Vehicular bridge**

6.2) Historic: **Vehicular bridge**

7. Property Description:

7.1) Date of Construction: **1940**

7.2) Briefly describe major features of the property:

This two-lane, single-span reinforced concrete, flat slab bridge crosses Makakupaia Stream. It has flush concrete parapet walls, and concrete rubble (basalt) masonry (CRM) abutments. Some of the original board-formed concrete is visible. The end parapet sections that curve outward (the only decorative detail) were added in 1979 to accommodate guardrails. The guardrails added in 1979 were later modified in 1995.

7.3) Briefly list previous alterations to the property:

In 1979, Federal Aid Project No. RS-0450(1) added new curving concrete extensions to accommodate new guardrails. As part of this project, concrete was also added on top of the original concrete parapet, raising the height roughly 8" to 2'-8" . In 1995, Federal Aid Project No. STP-045(6) modified the guardrails again.

8. Evaluation

8.1) Provide a brief evaluation of the property's historic integrity: mention if it retains integrity of materials, design, feeling, location, association, workmanship, setting

Modifications detract from the historic integrity of the original parapet design, the bridge's most visible feature: The addition of concrete raised its height from roughly 2' to 2'-8", and obscured its original edge details and some of the original board-formed concrete. The curving end sections added to the parapet in 1979 differ in design and feeling from the original linear parapet design. These changes result in a lack of integrity of design, feeling, workmanship and association that preclude eligibility for the State and National Registers.

8.2) Briefly describe the property's association with any areas of significance:

While the original structure was representative of Territorial-era bridge design, its 1979 modifications significantly altered its parapet, its most visible feature, and preclude eligibility for the State and National Registers.

9. Attach Photographs: The following are the minimum number and type of color photographs required:

Quantity	Description
1-2	Street view(s) of the resource and setting
1-2	Main Facades
1-2	interior photos(s) if applicable

10. Attach Map showing the location of the property

CHECKLIST

☒ **Historic Property Evaluation Form** (this form)

☒ **Photographs**

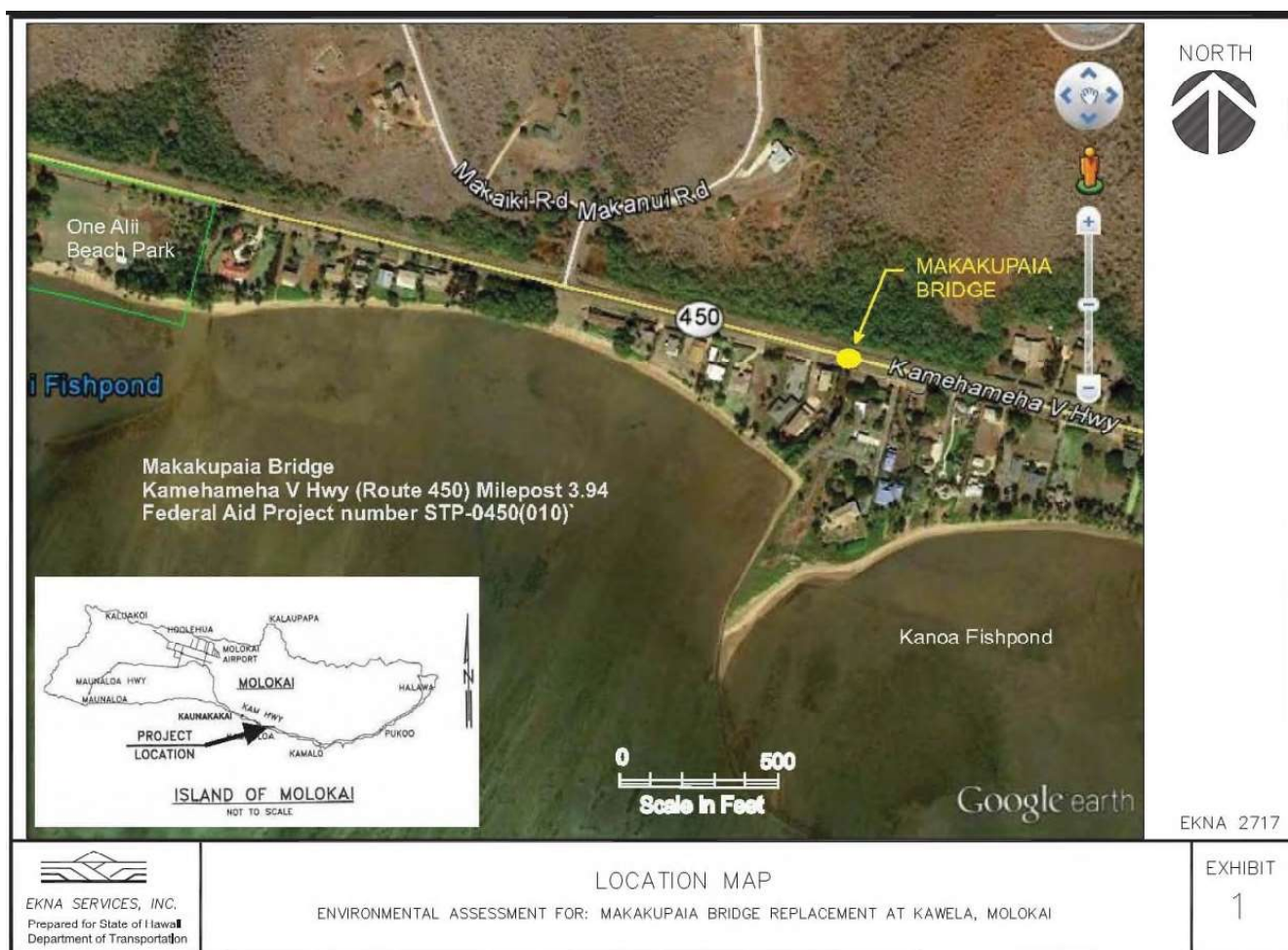
☒ **Map**

☐ **Filing Fee Form**

☐ **SIHP Request Form**

Makakupaia Bridge, Moloka'i, Hawaii

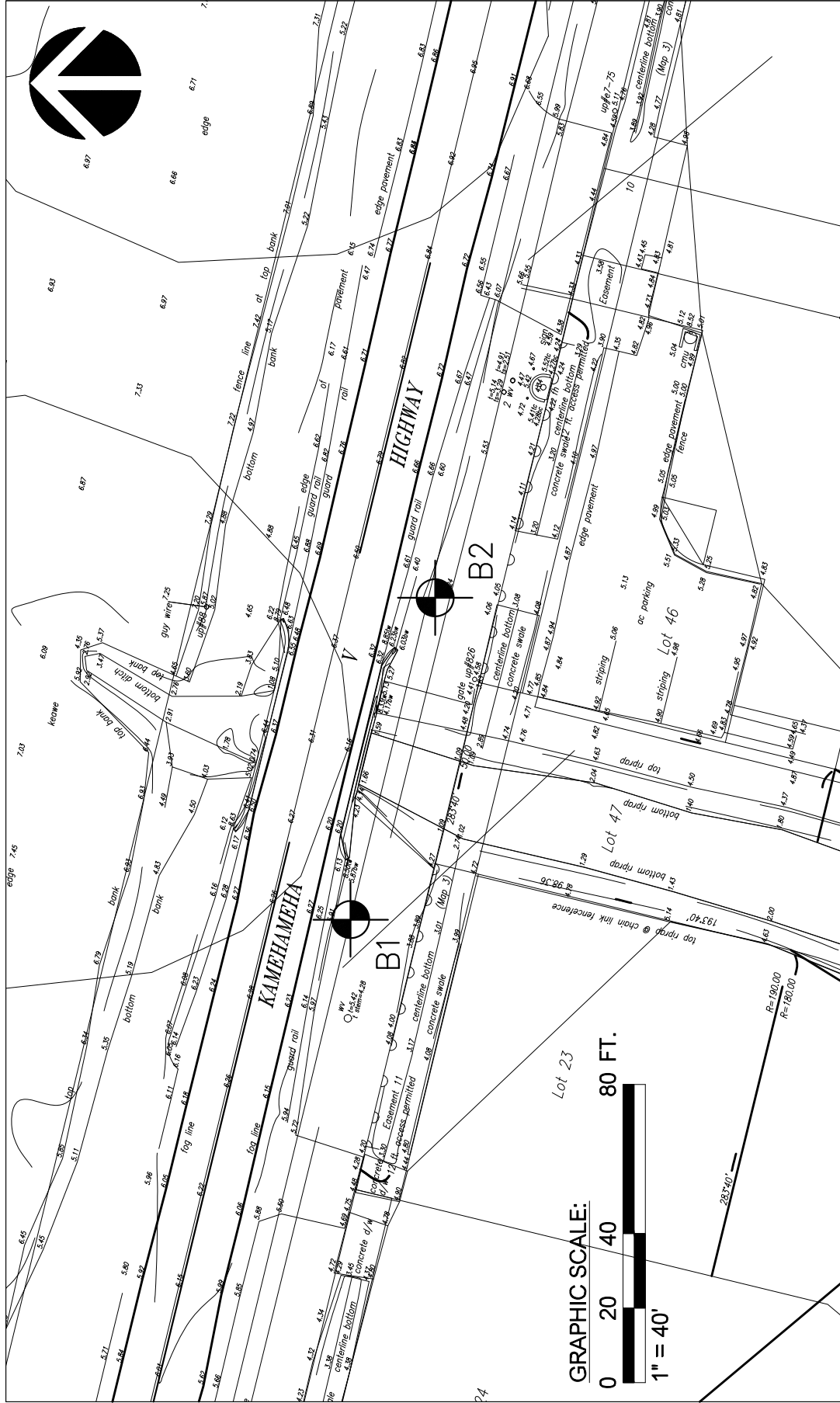
Map (Source: EKNA Services, Inc.)



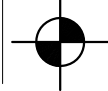
Makakupaia Bridge, Moloka'i, Hawaii

PHOTOS (Source: Mitsunaga & Associates)





LEGEND:



Approximate location
of borings



Hirata & Associates, Inc.

Geotechnical Engineering

W.O. 15-5864

Makapapa Stream Bridge Replacement

BORING LOCATION PLAN

Plate
A2.2

Reference: Topographic Survey provided by Mitsunaga & Associates, Inc. recieved on April 21, 2016.



BORING LOG

PROJECT NAME Makakupaia Stream Bridge Replacement

WORK ORDER NO. 15-5864 DRIVING WT. 140 lb. START DATE 1/25/16

SURFACE ELEV. 5.5 ±* DROP 30 in. END DATE 1/26/16

REMARKS	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
Begin HQ coring at 27 feet.			25	107	21			<input type="checkbox"/>	Silty CLAY (CL) - Mottled dark brown, moist, medium stiff, with sand and gravel.
			4	79	40	▼		<input type="checkbox"/>	Firm from 4 feet. Groundwater encountered at 4.0 feet on 1/25/16 at 10:40 am.
			15	99	15	5		<input type="checkbox"/>	SAND (SW) - Mottled tan and gray, medium dense.
			2	94	30	10		<input type="checkbox"/>	Silty SAND (SM) - Gray, loose.
			3	63	55	15		<input type="checkbox"/>	Silty GRAVEL (GM) - Gray, loose, with coralline sand.
			4	83	24	20		<input type="checkbox"/>	
			10/10"	76	33	25		<input type="checkbox"/>	
	100	95	10/No Penetration			30		<input type="checkbox"/>	BASALT (WS) - Gray, hard, slightly weathered.



BORING LOG

PROJECT NAME Makakupaia Stream Bridge Replacement

WORK ORDER NO. 15-5864 DRIVING WT. 140 lb. START DATE 1/25/16

SURFACE ELEV. 5.5 ±* DROP 30 in. END DATE 1/26/16

REMARKS	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
	100	100				35			
	100	100				40			
	98	82				45			Moderately weathered, vesicular from 42 feet.
	100	81				50			
									End boring at 50.5 feet.
						55			
						60			

* Elevation based on Topographic Survey provided by Mitsunaga & Associates, Inc. recieved on April 21, 2016.



BORING LOG

PROJECT NAME Makakupaia Stream Bridge Replacement

WORK ORDER NO. 15-5864 DRIVING WT. 140 lb. START DATE 1/27/16

SURFACE ELEV. 5.5 ± DROP 30 in. END DATE 1/28/16

REMARKS	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
			14	85	26			<input type="checkbox"/>	Silty CLAY (CL) - Mottled dark brown, moist, medium stiff, with sand and gravel.
			7	77	20	4.8		<input type="checkbox"/>	Groundwater encountered at 4.8 feet on 1/27/16 at 8:51 am.
			21	112	17			<input type="checkbox"/>	GRAVEL (GP) - Dark brown, medium dense, with coralline sand. Cobble from 6.5 to 7.5 feet.
			2	60	66	10		<input type="checkbox"/>	Silty GRAVEL (GM) - Gray, loose, with coralline sand.
			5	76	34	20		<input type="checkbox"/>	
			5	No Recovery		25		<input type="checkbox"/>	
			1	74	28	30		<input type="checkbox"/>	



BORING LOG

PROJECT NAME Makakupaia Stream Bridge Replacement

WORK ORDER NO. 15-5864 DRIVING WT. 140 lb. START DATE 1/27/16

SURFACE ELEV. 5.5 ± DROP 30 in. END DATE 1/28/16

REMARKS	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
Begin HQ coring at 31 feet.		10/No	Penetration						COBBLES AND BOULDERS - Gray, dense, in a matrix of silt, sand, and gravel. (Alluvium)
	64					35			
	100					40			
	50					45			
	82					50			
	36					55			WEATHERED BASALT (WC) - Mottled grayish brown, medium stiff, completely weathered.
	38								BASALT (WS) - Gray, hard, slightly weathered.
	72	47							
	97	44				60			

Plate A4.4

(Continued on Next Page)



BORING LOG

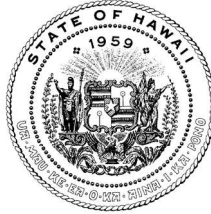
PROJECT NAME Makakupaia Stream Bridge Replacement

WORK ORDER NO. 15-5864 DRIVING WT. 140 lb. START DATE 1/27/16

SURFACE ELEV. 5.5 ± DROP 30 in. END DATE 1/28/16

REMARKS	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
									Moderately weathered from 60.5 to 63 feet.
						65			End boring at 64 feet.
						70			
						75			
						80			
						85			
						90			

DAVID Y. IGE
GOVERNOR OF
HAWAII



**STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES**

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

January 15, 2019

**IN REPLY REFER TO:
LOG NO: 2018.02724
DOC NO: 1812TGM11
Architecture, Archaeology**

Jade T. Butay, Director
Department of Transportation
State of Hawai'i
601 Kamkilo Blvd.
Kapolei, HI 96707
Via Email: jade.butay@hawaii.gov

Dear Mr. Butay:

**SUBJECT: HRS Chapter 6E-8 Historic Preservation Review
Makakupaia Bridge - Replacement
Kamehameha V Highway
Kawela Ahupua'a, Kona Moku, Island of Molokai
TMK: (2) 5-4-003:028 (por.); 5-4-017:044 (por.)**

Thank you for the opportunity to comment on this request from the Hawai'i Department of Transportation (HDOT) for Hawai'i Revised Statutes (HRS) Chapter 6E-8 review. The State Historic Preservation Division (SHPD) received this submittal on November 19, 2017. The submittal included the building permit application, SHPD 6E Submittal Form, permit set, Historic Property Evaluation, and photographs. The proposed scope of work includes replacing the existing bridge with new, constructing a temporary bypass road on the mauka side of the highway. A contractor staging area will be located on the mauka side of the highway east of the bridge.

Makakupaia bridge was built in 1940 as a concrete flat slab bridge. The Hawai'i State Historic Bridge Inventory Evaluation, conducted in 2013, found the bridge eligible under criterion C. In 2018, HDOT completed a Historic Property Evaluation (HPE) Survey Form and re-evaluated the bridge. The form found the bridge ineligible due to two projects that altered the character defining features of the bridge. The modifications included installing new curving concrete extensions to accommodate new guardrails and applying concrete on top of the parapet, raising the height roughly from 8" to 2'-8". The SHPD concurs with the findings of the HPE form for the Makakupaia bridge.

Previous archaeological investigations in the vicinity of the project area identified several historic sites. However, a 100 percent pedestrian survey was conducted within the project area; no surface archaeological resources or cultural deposits were identified by the surface survey.

The HPE Survey Form is considered an architectural survey report and therefore subject to filing fees per §13-275-4, HAR. Please complete the filing fee form (<https://dlnr.hawaii.gov/shpd/files/2013/05/SubmittalFilingFees.pdf>) and a State Inventory of Historic Places Request Form (<http://dlnr.hawaii.gov/shpd/review-compliance/forms/>). The filing fee form and the SIHP form can be submitted concurrently to dlnr.intake.shpd@hawaii.gov and reference LOG NO. 2018.02724; DOC NO 1812TGM11.

Per §13-275-7, HAR, the project will have no effect on significant historic properties and therefore SHPD concurs with HDOT's determination of **"no historic properties affected"**.

Please contact Stephanie Hacker, Historic Preservation Archaeologist, at Stephanie.Hacker@hawaii.gov or at (808) 692-8046 regarding archaeological resources, or Tanya Gumapac-McGuire, Architectural Historian, at (808) 692-8022 or at Tanya.Gumapac-McGuire@hawaii.gov regarding architectural resources or this letter.

Aloha,

Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Christine Yamasaki, christine.yamasaki@hawaii.gov
Meesa Otani, mesa.otani@dot.gov

APPENDIX D

Coordination, Comment and Response Letters

From: T Price [<mailto:envreview@gmail.com>]

Sent: Saturday, May 12, 2018 8:10 AM

To: Yamasaki, Christine <christine.yamasaki@hawaii.gov>; etamaye@ekmahawaii.com

Subject: Re: Draft Environmental Assessment and Anticipated Finding of No Significant Impact for the Kamehameha V Highway, Makakupia Bridge Replacement, Kawalela Ahupuaa, Kona District, Island of Molokai Federal-Aid Project No. BR-0450(10) TMK (2) 5-4-003:28 po...

To Ms. Christine Yamasaki, Project Manager, Christine.Yamasaki@hawaii.gov, State of Hawaii, Department of Transportation (DOT), 601 Kamokila Boulevard, Room 609, Kapolei, Hawaii 96707

Re: Letter from Jade T. Butay, Director of DOT to Scott Glenn, Director, Office of Environmental Quality Control on the *Draft Environmental Assessment and Anticipated Finding of No Significant Impact for the Kamehameha V Highway, Makakupia Bridge Replacement, Kawalela Ahupuaa, Kona District, Island of Molokai Federal-Aid Project No. BR-0450(10) TMK (2) 5-4-003:28 por and (2) 5-4-017:44 por*. Prepared for the Hawaii DOT by EKNA Services, Inc. dated March 2018

Dear Ms. Yamasaki:

Environmental Review, Inc. has reviewed the draft document and has the following comments:

- 1) Page 1 under the Proposed Action “existing abutments will be left in place to avoid impacts to existing ditch”. In the event that the abutments/area need an assessment for hazardous substances and mitigation prior to being left in place.
- 2) Page 2 Historical, Cultural, and Archaeological Background section - included is a citation to a 2013 evaluation by MKE Associates, LLC, Fung Associates, Inc. which refers to “metal thrie beams”, those should be surveyed for lead based paint (LBP) if paint is present since the original construction date of the bridge is the 1940s.
- 3) Page 2 the area of the bridge is described as 3.3 acres, that area should be surveyed for hazardous substances (e.g. for aerially deposited lead (ADL) from automobiles fueled by leaded gasoline, LBP from the structure if paint is present (soils around the structure and sediments in the creek), heavy metals and polynuclear aromatic hydrocarbons (PAHs), and semi-volatile organic compounds (SVOCs) (associated with the wooden guardrail posts). Treated-wood waste if generated should be appropriately tested prior to disposal.
- 4) Table of Contents –
 - a) The section of Proposed Mitigation Measures may need to add mitigation measures for hazardous substances if an assessment shows the need (e.g soils for ADL and LBP, treated wood posts for PAHs, metals). The soils and sediments under the bridge associated with any paint chipping off of any painted surface if present or metal brackets/guardrail structures associated with the bridge does not appear to have been tested yet.
 - b) An Appendix should be added to include an assessment report for hazardous substances.
- 5) Page 6 top of the page – the statement that the existing bridge allows rainfall runoff with concrete-lined swales, an assessment of the sediment at the bottom of the swale associated with runoff from the bridge should be tested for hazardous substances.

- 6) Page 7 – A description of the construction of 3-foot diameter drilled shafts should include plans to test surface soils for hazardous substances associated with the bridge construction and location (e.g. possible testing suite may include metals, especially lead, PAHs, SVOCs).
- 7) Pages 9-10 – The description of soils and conclusion that no mitigation measures are needed is unsupported. This section should summarize the results of a hazardous substances assessment to come to the conclusion that mitigation measure may or may not be needed. For example if soil sampling for hazardous substances shows ADL, LBP, PAHs, or SVOCs then mitigation measures for soil may be needed.
- 8) Page 10 – The description of water resources and conclusion that no mitigation measures are needed is unsupported. This section should summarize the results of a hazardous substances assessment to come to the conclusion that mitigation measures may or may not be needed. For example if significant levels of hazardous substances were found in sediments in the creek/wetlands below the bridge, dredging in that location may require some mitigation measures to protect water resources.
- 9) Page 15 – The description of air quality and the conclusion that no mitigation measures are needed should discuss worker safety and the proximity of residences to the construction area. A Health and Safety Plan should describe what measures will be employed to avoid worker's inhalation of dust and include a prohibition of grinding on painted surfaces to avoid the potential acute hazard of inhalation of toxic airborne lead by workers. Will air monitoring be conducted to ensure that dust does not impact the adjacent residences?
- 10) Page 21 – The statement is made that the project is consistent with the general plans appears to be false since this project appears to have overlooked the need to conduct an assessment for hazardous substances. If an assessment was conducted, a report should have been included in the appendices section of the *Environmental Assessment Report*. If an assessment identifies concerns for hazardous substances, mitigation measures might be required by the local oversight agencies including project specific soil management plans including soil characterization and disposal requirements and health and safety plan.
- 11) Page 22 – The statement that the project is “Not contrary to Chapter 205A, HRS.” Should include a description of what that is (?) so that it is understandable to a layman.
- 12) Page 25 – The statement that best management practices (BMPs) will be employed should include a description of what those will include (?) to that it is understandable to a layman (e.g. visual and instrumental air monitoring, soil wetting, minimizing soil drop heights while loading trucks, tarping loads on trucks...).
- 13) Exhibit 5 – The exhibit shows an asbuilt figure which shows a planned excavation to “+3” feet. Spoils from that planned excavation should be tested for hazardous substances (e.g. metals, esp. lead in general and PAHs and SVOCs in areas near the guardrail posts) to determine appropriate soil handling and disposal procedures.
- 14) Appendix B Archeological Assessments (starting on page 68 of the *Environmental Assessment Report*), *Routine (Periodic Bridge Inspection Report* prepared by Nagamine Okawa Engineers, Inc. dated January 2010-

a) Photograph 5 (on page 80 of the *Environmental Assessment Report*) shows “upstream Outboard Approach Guardrail Transition” shows vegetation and exposed soil which should be tested for hazardous substances (e.g. especially metals).

b) Photograph 7 (on page 81 of the *Environmental Assessment Report*) – “Collision Damage in Upstream Outbound Approach Guardrail End” shows posts installed into the ground, those appear to be timbers which should be tested for hazardous substances (e.g. PAHs, SVOCs, and metals).

c) Photograph 8 7 (on page 81 of the *Environmental Assessment Report*) – “Downstream Outbound Guardrail Transition” appears to show red paint on the concrete surface and guardrail structures. Those should be tested for LBP (if paint is present).

When responses to these comments are available, please send those to me at envreview@gmail.com.

Sincerely yours, Tom Price-Director, Environmental Review, Inc., 1792 Rogers Avenue, San Jose, California 95112 www.envreview.org

Cc: Ms. Elaine Tamaye, EKNA Services, Inc., etamaye@eknahawaii.com

From: T Price [<mailto:envreview@gmail.com>]

Sent: Saturday, May 12, 2018 1:45 PM

To: Yamasaki, Christine <christine.yamasaki@hawaii.gov>; etamaye@eknahawaii.com

Subject: Draft Environmental Assessment and Anticipated Finding of No Significant Impact for the Kamehameha V Highway, Makakupia Bridge Replacement, Kawalela Ahupuaa, Kona District, Island of Molokai

Ms. Christine Yamasaki, Project Manager, Christine.Yamasaki@hawaii.gov, State of Hawaii, Department of Transportation, 601 Kamokila Boulevard, Room 609, Kapolei, Hawaii 96707

Dear Ms. Yamasaki:

Please make corrections to my comments sent earlier today as follows:

Correction to Comment 1): Page 1 under the Proposed Action “existing abutments will be left in place to avoid impacts to existing ditch”. This should be revised in the event that the abutments/area need an assessment for hazardous substances and/or mitigation prior to being left in place.

Thank you, Tom Price-Director, Environmental Review, Inc. 1792 Rogers Ave, San Jose, CA 95112, www.envreview.org

cc: Ms. Elaine Tamaye, etamaye@eknahawaii.com

DAVID Y. IGE
GOVERNOR



HIGHWAY DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
LANDSCAPING DESIGN SECTION, ROOM 688A
TECHNICAL DESIGN SECTION, ROOM 688

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

JADE T. BUTAY
DIRECTOR

Deputy Directors
LYNN A.S. ARAKI-REGAN
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

IN REPLY REFER TO:
HWY-DD 2.8242

February 07, 2019

Mr. Tom Price, Director
Environmental Review, Inc.
1792 Rogers Avenue
San Jose, California 95112

Subject: Comments on Draft Environmental Assessment
Kamehameha V Highway, Makakupaia Bridge Replacement
Kona District, Kawela Ahupuaa, Island of Molokai
TMKs: (2)5-4-003:28 (por.) and (2)5-4-017:44 (por.)

Dear Mr. Price,

Thank you for your email dated May 12, 2018, providing comments on the Draft Environmental Assessment (DEA) for the replacement of Makakupaia Bridge. The comments and responses on the DEA are listed below.

- 1) Page 1 under the Proposed Action: "existing abutments will be left in place to avoid impacts to existing ditch." In the event that the abutments/area need an assessment for hazardous substances and mitigation prior to being left in place.

Response

There is little concern for hazardous substances and or mitigation associated with the removal of the existing 28-foot wide x 23-foot long concrete bridge. The existing abutments are Concrete Rubble Masonry construction and pose no hazard concern.

- 2) Page 2 Historical, Cultural, and Archaeological Background section: included is a citation to a 2013 evaluation by MKE Associates, LLC, Fung Associates, Inc. which refers to "metal thrie beams," those should be surveyed for lead based paint (LBP) if paint is present since the original construction date of the bridge is the 1940s.

Response

The metal guardrails have been recently replaced as part of highway resurfacing and are not the original construction. Therefore, LBP is not present.

- 3) Page 2: the area of the bridge is described as 3.3 acres. That area should be surveyed for hazardous substances (e.g. for aerially deposited lead (ADL) from automobiles fueled by leaded gasoline, LBP from the structure if paint is present (soils around the structure and sediments in the creek), heavy metals and polynuclear aromatic hydrocarbons (PAHs), and semi-volatile organic compounds (SVOCs) (associated with the wooden guardrail posts)). Treated-wood waste if generated should be appropriately tested prior to disposal.

Response

The area of potential effect (APE) is approximately 3.3 acres, but the area occupied by the bridge and highway that are directly impacted by reconstruction is about 50' x 300' (0.34 acres). This section of rural highway has low traffic volume, no LBP on structures, and no treated wood components. The undeveloped area on the mountain-side of the bridge/highway that is within the APE is undeveloped kiawe forest.

- 4) Table of Contents
- a) The section of Proposed Mitigation Measures may need to add mitigation measures for hazardous substances if an assessment shows the need (e.g. soils for ADL and LBP, treated wood posts for PAHs, metals). The soils and sediments under the bridge associated with any paint chipping off of any painted surface if present or metal brackets/guardrail structures associated with the bridge does not appear to have been tested yet.
 - b) An Appendix should be added to include an assessment report for hazardous substances.

Response

Due to the low potential for encountering hazardous substances, sampling/assessment for hazardous substances is not warranted.

- 5) Page 6 top of the page – the statement that the existing bridge allows rainfall runoff with concrete-lined swales: an assessment of the sediment at the bottom of the swale associated with runoff from the bridge should be tested for hazardous substances.

Response

The bridge does not allow runoff directly into the ditch because of the concrete railings. The purpose of the bridge is to allow runoff from the mountain-side kiawe forest to drain under (instead of over) the highway.

- 6) Page 7: A description of the construction of 3-foot diameter drilled shafts should include plans to test surface soils for hazardous substances associated with the bridge construction

and location (e.g. possible testing suite may include metals, especially lead, PAHs, SVOCs).

Response

The drilled shafts are in rock located within the limits of the existing highway pavement (no exposed surface soils).

- 7) Pages 9-10: The description of soils and conclusion that no mitigation measures are needed is unsupported. This section should summarize the results of a hazardous substances assessment to come to the conclusion that mitigation measure may or may not be needed. For example, if soil sampling for hazardous substances shows ADL, LBP, PAHs, or SVOCs then mitigation measures for soil may be needed.

Response

See previous responses to comments.

- 8) Page 10: The description of water resources and conclusion that no mitigation measures are needed is unsupported. This section should summarize the results of a hazardous substances assessment to come to the conclusion that mitigation measures may or may not be needed. For example, if significant levels of hazardous substances were found in sediments in the creek/wetlands below the bridge, dredging in that location may require some mitigation measures to protect water resources.

Response

There will be no disturbance of sediments in the stormwater channel. No dredging or construction will be conducted within the limits of the ditch.

- 9) Page 15: The description of air quality and the conclusion that no mitigation measures are needed should discuss worker safety and the proximity of residences to the construction area. A Health and Safety Plan should describe what measures will be employed to avoid worker's inhalation of dust and include a prohibition of grinding on painted surfaces to avoid the potential acute hazard of inhalation of toxic airborne lead by workers. Will air monitoring be conducted to ensure that dust does not impact the adjacent residences?

Response

Dust control will be implemented as a standard best management practices (BMP). There will be no grinding associated with the demolition of the existing bridge.

- 10) Page 21: The statement is made that the project is consistent with the general plans appears to be false since this project appears to have overlooked the need to conduct an assessment for hazardous substances. If an assessment was conducted, a report should have been included in the appendices section of the *Environmental Assessment Report*. If an

assessment identifies concerns for hazardous substances, mitigation measures might be required by the local oversight agencies including project specific soil management plans including soil characterization and disposal requirements and health and safety plan.

Response

See previous responses to comments.

- 11) Page 22: The statement that the project is “Not contrary to Chapter 205A, HRS.” Should include a description of what that is (?) so that it is understandable to a layman.

Response

Chapter 205A HRS addresses the state’s coastal zone management program, objectives and policies. The project area is within the Special Management Area (SMA) and therefore will be required to obtain a SMA permit from Maui County as described in the DEA.

- 12) Page 25: The statement that BMPs will be employed should include a description of what those will include (?) so that it is understandable to a layman (e.g. visual and instrumental air monitoring, soil wetting, minimizing soil drop heights while loading trucks, tarping loads on trucks...).

Response

Standard construction BMPs are employed to adhere to state and county rules and to comply with recommendations of state and federal environmental agencies.

- 13) Exhibit 5: The exhibit shows an as built figure which shows a planned excavation to “+3” feet. Spoils from that planned excavation should be tested for hazardous substances (e.g. metals, esp. lead in general and PAHs and SVOCs in areas near the guardrail posts) to determine appropriate soil handling and disposal procedures.

Response

Excavation was required to construct the existing bridge. No significant excavation will be required for the construction of the replacement bridge.

- 14) Appendix B Archeological Assessments (starting on page 68 of the *Environmental Assessment Report*), *Routine (Periodic Bridge Inspection Report* prepared by Nagamine Okawa Engineers, Inc. dated January 2010).
- a) Photograph 5 (on page 80 of the *Environmental Assessment Report*) shows “upstream Outboard Approach Guardrail Transition” shows vegetation and exposed soil which should be tested for hazardous substances (e.g. especially metals).

Mr. Tom Price
February 07, 2019
Page 5

HWY-DD 2.8242

- b) Photograph 7 (on page 81 of the *Environmental Assessment Report*): “Collision Damage in Upstream Outbound Approach Guardrail End” shows posts installed into the ground, those appear to be timbers which should be tested for hazardous substances (e.g. PAHs, SVOCs, and metals).
- c) Photograph 8 7 (on page 81 of the *Environmental Assessment Report*): “Downstream Outbound Guardrail Transition” appears to show red paint on the concrete surface and guardrail structures. Those should be tested for LBP (if paint is present).

Response

The photographs from the 2010 report by Nagamine Okawa Engineers do not depict the current condition of the bridge and approaches subsequent to recent highway resurfacing and guardrail improvements. The November 2015 photographs contained in the DEA reflects the current condition.

Should you have any questions, please call Christine Yamasaki at (808) 692-7572 of our Design Section, Design Branch, Highways Division, or email at christine.yamasaki@hawaii.gov.

Sincerely,

Curtis Matsuda

CURTIS MATSUDA
Acting Engineering Program Manager
Design Branch, Highways Division

JSER:mk

bc: DIR, DEP-HWY, HWY, HWY-DD (CY), HWY-DE



June 7, 2018

Christine Yamasaki
Project Manager
State of Hawai'i Department of Transportation
601 Kamokila Boulevard, Room 609
Kapolei, Hawai'i 96707

Re: Draft Environmental Assessment
Makakupa'ia Bridge Replacement
Kona District, Kawela Ahupua'a, Island of Moloka'i
TMK: (2) 5-4-003:28 por. and (2) 5-4-017:44 por.]

Dear Ms. Yamasaki:

Historic Hawai'i Foundation is providing comments on the Draft Environmental Assessment (EA) for the above mentioned project and is also requesting continuing consultation under Section 106 of the National Historic Preservation Act.

Interests of Historic Hawai'i Foundation

Historic Hawai'i Foundation (HHF) is a statewide nonprofit organization established in 1974 to encourage the preservation of sites, buildings, structures, objects and districts that are significant to the history of Hawai'i.

HHF has reviewed the Draft EA, dated March 2018, containing the scope of work and attached exhibits, including an Archaeological Assessment and the HDOT State Historic Inventory Form for the Makakupa'ia Bridge and is providing comments related to the environmental assessment required by HRS §343, the historic preservation review required by HRS §6E and the historic preservation review required by 36CFR800.

HHF is a consulting party to the FHWA and its state and local partners pursuant to the implementing regulations of the National Historic Preservation Act (NHPA) at 36 Part 800.2(c)(5) as an organization with a demonstrated interest in the undertaking and a concern for the effects on historic properties.

Undertaking

The project proposes to replace the historic Makakupa'ia Bridge located about 4 miles east of Kaunakakai town on Kamehameha V Highway (Route 450).

Summary of HHF Comments

HHF disagrees with the Anticipated Finding of No Significant Impact (AFNSI) due to the proposed demolition of a historic property, which is an irreversible effect on a cultural resource.

HHF also concludes that the undertaking is required to comply with the National Historic Preservation Act Section 106 due to the federal funding through the Federal Highway Administration (FHWA), and this process is incomplete.

NHPA Section 106 Consultation Documentation Shows the Process is Not Concluded

- The Federal Highway Administration (FHWA) has authorized the Hawai'i Department of Transportation (HDOT) to act on behalf of FHWA regarding the NHPA Section 106 notification and consultation.¹
- On June 3, 2016 HDOT requested concurrence from the Hawai'i State Historic Preservation Officer (SHPO) on the proposed Area of Potential Effect (APE). SHPO concurred on the APE only and stated that they “looked forward to future consultation and successful completion of the NHPA Section 106 process” [emphasis added].
- On July 18, 2017, in a letter to SHPO, HDOT “initiate[d] Section 106 consultation for the proposed project”.
- HDOT neglected to include Historic Hawai'i Foundation as a consulting party in the consultation request, despite the fact that HHF has a standing request to be a consulting party on all FHWA/HDOT undertakings that have the potential to affect historic properties and has otherwise been routinely included in Section 106 consultation. HHF was therefore not afforded the opportunity to comment or participate.
- Exhibit C of the Draft EA includes the documentation related to the Section 106 process. The documentation shows that the consultation was initiated, but not concluded. There is no evidence that HDOT proposed a determination of effect, or that SHPD concurred on a determination of effect, nor that there was any resolution of effects.
- The documents in Exhibit C do not include any indication that SHPO has responded to the HDOT July 18, 2017 letter initiating consultation.
- The documentation fails to show either that the process was completed or that it was terminated.

HHF concludes that the NHPA Section 106 compliance is still pending.

APE: The Area of Potential Effect includes the HDOT right-of-way, temporary access across private land for the temporary by-pass and a contractor's staging area. This was reviewed by and concurred with by SHPO in June 2016.

Identification of Historic Resources: The Archaeological Assessment (AA) by Pacific Legacy² (Appendix B of the Draft EA) determined that the bridge is eligible for listing on the Hawai'i and National Registers of Historic Places, consistent with the HDOT finding in the a State Historic Bridges Inventory (2014).

The Draft EA incorrectly states that there are no significant cultural resources within the project area (DEA Paragraph 2.1.6 Historic, Archaeological and Cultural Resources). As a historic

¹ FHWA Letter to Hawai'i SHPO, dated February 1, 2016.

² Draft EA, APPENDIX B: Archaeological Assessment for Makakupa'ia Bridge Replacement Project Kawela Ahupua'a, Kona District, Island of Moloka'i; Pacific Legacy, March 8, 2018.

property eligible for listing on the National Register, the historic Makakupaʻia Bridge is an identified cultural resource.

The EA asserts that:

“As a part of conducting research on this bridge, brief informal consultations were undertaken with Susan Lebo and Jessica Puff at the SHPD. It is their opinion that the Makakupaʻia Bridge is to be considered a historic property because it has been determined eligible for listing on both the NRHP and the HRHP. As such, effect determinations and mitigation measures need to be recommended as part of the current AA. These recommendations are made in Section 8.1.” (AA p. 42)

“The integral features of the bridge and the modifications to the bridge have been well documented with written descriptions, photographs, and scaled drawings (see Appendix D and Appendix E [of the AA]). These documents have mitigated the "adverse effect" that the project will have on this historic property. No further documentation of this bridge is recommended.” (AA p. 46)

HHF disagrees that this process constitutes a Section 106 consultation under 36 CFR 800.3 or that previous documentation of the bridge comprises adequate mitigation for an irreversible effect on a historic property.

Determination of Effect: HDOT’s letter of July 18, 2017, opening consultation does not contain a finding by FHWA or HDOT of a determination of effect.

An adverse effect occurs when the characteristics that qualify a property for the National Register are degraded (see 36 CFR 800.5 & 11), including:

- Demolition: [(1) physical destruction]
- Alteration of character-defining features: [(iv) Change of the... physical features... that contribute to its historic significance]

Historic Hawai‘i Foundation concludes that the proposed undertaking would have an adverse effect on a historic property as defined in 36 CFR 800.5.

Section 106 Consultation Process under the National Historic Preservation Act (NHPA):

The EA includes references to ongoing Section 106 consultation:

- HDOT’s Historic Bridges Inventory states that as of 2013 the bridge is “undergoing consultation” for replacement in 2015 (p. 5-9). However, the Archaeological Assessment (in Appendix B of the EA) states that “Regrettably, documentation of these consultations has not been located.” (AA p. 42)
- Appendix C of the EA contains a letter dated July 18, 2017 to SHPD initiating consultation for the proposed project. There is no response from SHPD in Appendix C of the EA.

- HDOT, acting on behalf of FHWA, has initiated Section 106 consultation but has failed to identify other consulting parties as required under Section 800.3(f).
- HDOT has determined the bridge to be eligible for listing on the National Register of Historic Places (HDOT Historic Bridges Inventory, 2013).
- Demolition of the bridge would be an adverse effect (Appendix B of the EA: Archaeological Assessment, Abstract Statement, paragraph 3, p. i), as defined in 36 CFR 800.5.

Under the Section 106 process, SHPD must concur that the bridge is eligible for listing as a historic property, and that its demolition constitutes an adverse effect. There is no documentation of this step.

The determination of an adverse effect will require resolution of effects and a Memorandum of Agreement (MOA) describing the agreed upon stipulations for avoiding, minimizing and mitigating the adverse effect. The MOA is to be developed through a consultation process involving SHPD and consulting parties.

The EA needs to contain a completed Section 106 consultation and the associated agreement for resolution of effects.

HHF reaffirms its request to be a consulting party to the incomplete NHPA Section 106 consultation.

Historic Hawai'i Foundation looks forward to continuing consultation under Section 106 of the National Historic Preservation Act to resolve the outstanding issues and avoid, minimize or mitigate any adverse effects on the historic Makakupa'ia Bridge.

Until and unless the adverse effect is resolved, the Anticipated Finding of No Significant Impact is premature and unwarranted.

Very truly yours,



Kiersten Faulkner
Executive Director

Copies via email:

FHWA:	Ralph Rizzo, Division Administrator
SHPD:	Kaiwi Yoon and Susan Lebo
EKNA Services, Inc.:	Elaine Tamaye via email to etamaye@eknahawaii.com

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BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
LANDSCAPING DESIGN SECTION, ROOM 688A
TECHNICAL DESIGN SECTION, ROOM 688

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:
HWY-DD 2.7189

September 7, 2018

Ms. Kiersten Faulkner
Executive Director
Historic Hawaii Foundation
680 Iwilei Road, Suite 690
Honolulu, Hawaii 96817

Subject: Comments on Draft Environmental Assessment
Makakupaia Bridge Replacement
Kona District, Kawela Ahupuaa, Island of Molokai
TMK: (2)5-4-003:28 (por) and (2)5-4-017:44 (por)

Dear Ms. Faulkner,

Thank you for your letter dated June 7, 2018, providing comments on the Draft Environmental Assessment for the replacement of Makakupaia Bridge. The Hawaii Department of Transportation (HDOT) is continuing consultation with the State Historic Preservation Division (SHPD).

HDOT invites the Historic Hawaii Foundation to be a part of the Section 106 consultation process for this project. Our consultation list was generated from <https://www.doi.gov> and an ad was placed in the Honolulu Star-Advertiser on July 28, 2017.

We welcome any comments you may have on this project's proposed improvements. We are particularly interested in any information you have on the historic and cultural sites that have been recorded in the area or any other historic or cultural sites about which you may have knowledge. In addition, if you are acquainted with any persons or organization that is knowledgeable about the proposed project area, or any descendants with ancestral, lineal or cultural ties to or cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area, we would appreciate receiving their names and contact information.

We can be contacted via Christine Yamasaki, Project Manager, email at christine.yamasaki@hawaii.gov, or by U.S. Postal Service to State of Hawaii, Department of Transportation, 601 Kamokila Boulevard., Room 609, Kapolei, Hawaii 96707.

Ms. Kiersten Faulkner
September 7, 2018
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Please feel free to contact Christine Yamasaki by telephone at (808) 692-7572, if you have any questions. We look forward to working with you and the SHPD on these needed improvements.

Sincerely,

Curtis Matsuda

CURTIS MATSUDA
Acting Engineering Program Manager
Design Branch, Highways Division